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WSE MEETING NOTICES—PAGE TWO

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Midwest Engineer

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Serving the Engineering Profession

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CONTENTS

Western Society Activities This Month

(Monday night is WSE night at our Headquarters)

Fellowship—5 to 6 p.m.; Dinner—6 to 7 p.m.; Meeting—7 p.m.

Harold A. Lockhart

January 9, Panel Heating

SPONSORED BY THE MECHANICAL ENGINEERING SECTION

Harold A. Lockhart, Chief Engineer of Bell & Gossett Company, will speak Monday, January 9 on the subject, "Five Years of Progress in Panel Heating."

Mr. Lockhart graduated from the University of Minnesota in 1929 with a B.M.E. degree. After early experience with the Insulite Company, Minneapolis, and the Stoker Company, St. Paul, he joined the Bell and Gossett Company in 1934, working with all the phases of development of the hot water heating industry as we know it today. He has been Chief Engineer for Bell & Gossett Company since 1935, and has been working on panel heating research since 1936.

January 23, Airway Controls

SPONSORED BY THE ELECTRICAL AND COMMUNICATIONS ENGINEERING SECTIONS

"Electronics in the Operation of the Federal Airways," will be the subject presented by a panel of three speakers from the Civil Aeronautics Administration Monday, January 23, 1950 at WSE headquarters.

CAA representatives will include S. M. Richie, Deputy Chief of the Chicago CAA Regional Headquarters Facilities Division; John R. Fielding, Senior Air Route Traffic Controller of the Chicago Air Traffic Control Center, and Arthur J. Dore', (WSE) Electrical Engineer in the Facilities Division.

January 30, CTA Policy

SPONSORED BY THE TRANSPORTATION ENGINEERING SECTION

The Western Society of Engineers is proud to announce that Ralph Budd, Chairman of the Board of the Chicago Transit Authority will speak at WSE headquarters, Monday, January 30, 1950, on the subject, "Policy Problems of the Chicago Transit Authority, and Their Solution."

Guest Cards

Many of the wives and adult daughters of WSE members now have guest cards, but if you have neglected to request them for your family, just call WSE headquarters.

Cards will be issued in the name of the wives or daughters desiring them, and WSE extends an invitation for the use of the dining room and lounge for lunch or dinner, or for rest and refreshments while shopping.

WSE wives will like the comfortable and attractive quarters, and will find a friendly welcome.

December 20, Reserve Meeting

The Western Society of Engineers has accepted the invitation of the U. S. Army Division Engineer to act as co-sponsor of a RESERVE CORPS ENGINEER CONSTRUCTION BRIGADE HEADQUARTERS to consist of 39 officers and 166 enlisted men. Only officer personnel will be selected at this time. See Page 15 for details of December 20 meeting.

Christmas Season at WSE

Members of the Western Society of Engineers, their wives and children, are invited to visit the headquarters during the Christmas season. You'll want to see our beautiful tree in the Lounge, and have lunch in the dining room. We'll be serving tea, and snacks for the children, during the holiday afternoons.

The headquarters is so convenient—you can meet the family here, and have dinner before returning home.

December 19, Chicago Area Water Supply

SPONSORED BY THE HYDRAULIC, SANITARY AND MUNICIPAL ENGINEERING SECTION

Arthur W. Consoer

Loran D. Gayton

Dr. A. M. Buswell

The water supply shortage in the metropolitan Chicago area caused by the lowering of the ground water table will be discussed by three speakers, Monday, December 19, 1949 in the WSE headquarters.

The State Water Survey Division at Urbana, will provide factual data on ground water static level observations for the Chicago area, extending back as far as their records permit. Dr. A. M. Buswell, Chief of the Division, will present the data, and several members of the Water Survey staff will be present to answer any questions which may arise.

Arthur W. Consoer, a partner in the firm of Consoer, Townsend & Associates, will discuss the problems of the municipalities and industries having ground water supplies. He will explain the difficulty of outlying municipalities in obtaining Lake Michigan water at a favorable rate, and their resulting efforts to prolong the use of wells.

Loran D. Gayton, Assistant City Engineer, will outline a possible extension of the Chicago water supply system to furnish Lake Michigan water to the municipalities in the area. According to Mr. Gayton, the system to be described could supply Lake Michigan water to sixty-two municipalities, all within forty miles of Chicago, and now depending on well-water supplies.

Dr. Buswell, who has been Chief of the Illinois State Water Survey since 1920, is listed as a chemist in *Who's Who in America*, 1948-49. He graduated from the University of Minnesota in 1910, received his A.M. from the University of Maine in 1912, and the Ph.D. from Columbia University in 1917.

Starting as Associate Professor of Sanitary Chemistry at the University of Illinois in 1920, he was Professor of Chemistry from 1931 to 1944, and has been a Research Professor since 1945.

He is a member of numerous professional and technical organizations, among them the A.A.A.S. and the American Institute of Chemists, of which he is a fellow, the American Chemical Society, and the American Water Works Association.

Mr. Consoer is Chief Executive Partner and Chief Engineer of Consoer, Townsend & Associates, consulting engineers. Prior to his association with the firm in 1919, he held positions with the Milwaukee Road, Western Engineering Company of Chicago, and Illinois Steel Company of Chicago, and was Assistant City Engineer of Oak Park. From 1914 to 1919 he was associated with the Illinois State Highway Department, rising to Bridge Engineer, and from 1917 to 1919 was on leave with the Army Corps of Engineers, serving 24 months in the A.E.F.

His particular attention in his firm is given to design of bridges, viaducts and other structures, highways, airports, city planning, zoning, valuations and water supply.

He graduated in 1914 from the University of Wisconsin with the degree of B.S. in Civil Engineering, and is a member of the ASCE, ASTM, the American Water Works Association and other organizations.

Mr. Gayton has been connected with the Bureau of Engineering of the City of Chicago for thirty-six years. He was City Engineer from 1927 to 1931, and from 1933 to 1941. Mr. Gayton has a C.E. degree from the University of Illinois.

He is a Past President of the Illinois Society of Professional Engineers, the Illinois Section of the ASCE, and the Engineers' Club of Chicago. He has been a member of the American Water Works Association since 1924.

Many of the units making up the present Chicago water supply system were designed and constructed under Mr. Gayton's direction, including the Western Avenue, Thomas Jefferson, and Cermak pumping stations, the William E. Dever crib, and the Chicago Avenue lake and land tunnel system.

Cleaner Air for Chicago

"Chicago is setting an example . . ."—Leverett Lyon
"Results speak for themselves . . ."—Mayor Martin Kennelly
"A Problem in Technology . . ."—Clyde Williams

Presented at a meeting of the Chicago Association of Commerce and Industry, October 25, 1949.

CHAIRMAN LEVERETT LYON, chief administrative officer of the Chicago Association of Commerce and Industry:

Although this Association has been engaged in various aspects of working for cleaner air for many years, our present program was taken up at the close of World War II.

The current Cleaner Chicago work of the Association takes several forms. The most varied form is the work by the Cleaner Air Committee of which Vernon Leach is chairman, and by the several sub-committees of that Cleaner Air Committee.

When we organized this work, we made a somewhat different approach from that which is common in most cities. Most cities which have undertaken the work in cleaner air, have gone on the assumption that the only people who should be interested, are those whose property is damaged by smoke and other forms of air pollution. They, therefore, usually organize a committee of those people whose business it is to carry on activities which necessarily result, to some degree, in air pollution.

We have worked on the assumption that it is not desirable to shut down every factory and every business in Chicago to improve the qualities of our air, and our approach has been to work fully as much with committees representing the businesses which necessarily contribute something in the way of air pollution, as it has to work with the people in the industries who are on the receiving side of air pollution.

Two of the important sub-committees are the committee of railroad executives, and the committee of foundry executives, both of them very active in exchanging information that will be helpful in the Cleaner Air program. The steel producers and the chemical industries will probably be the next fields where sub-committees will be organized.

The Cleaner Air Committee also conducts a year-round educational program to aid all Chicago businesses in conveying information about the program to their engineers, firemen, janitors, and even to their employees about individual firing at home.

We have some reason to feel that Chicago is setting an example for other cities in the methods which we have been using in dealing with air pollution. Not only do we have visits from other cities' officials asking for our help, but we find almost without exception that when we write to other cities asking for suggestions, they reply by saying, "You're already ahead of us. We should like to get information about your program."

Now, to address us today in observance of Cleaner Air Week we have two speakers. First is our Mayor, and of course we all know him so well an introduction is unnecessary.

I only want to say that everyone in Chicago has, I know, been impressed with the very important and useful program which he has been carrying on in the interest of a cleaner city.

The Mayor's program has been a fundamental one, since it has begun with the providing of the equipment which makes it possible to do this work and in which great and significant progress has been made.

I would like, therefore, to present to you our Mayor with the observation that, as you might think appropriate, what we believe in is a "clean city for a clean Mayor."

MAYOR KENNELLY:

Thank you very much, Mr. Lyon. Do you mean, I come clean from Chicago?

Well, I first want to thank the Association for their interest in Chicago, and the help they have given to the city not only in cleaner air but everything relating to city government.

It is estimated that Chicago pays 35 million dollars a year as the cost of smoke and dust. This includes actual damage to property from the dust and the waste of fuel, due to improper combustion.

I'll cite a few figures to show our record in this regard. Under the direction of Frank Chambers, head of the Department of Smoke Inspection and Abatement, for the first 9 months of this year, the experiments show an average of 50 tons of dust per square mile over Chicago. This compares to 56 tons per month per square mile in 1948, 61 tons in 1947, and 75 tons in 1943.

Even a more dramatic figure—back in 1926, when the dust-fall study started, there were 10,000 lbs. of dust per square block per month over the city of Chicago. In 1946, this had been reduced to 2,040 lbs. per square block per month, and by 1948 this had been reduced to 1,700 lbs. per month per square block.

This improvement has been accomplished through stricter enforcement and cooperation.

Results speak for themselves. In 1947, there were 4,190 locomotive violations reported to the City; in 1948, this had been cut in half with only 2,713 locomotives reported, and this year the railroads are found to be responsible for only 5% of the smoke in Chicago. 95% now is caused by heating plants of one kind or another—apartment buildings, factories, foundries and private residences.

But not all of our efforts are directed against smoke alone. Today, 4/5 of the smog that hovers over Chicago from time to time is not caused by smoke, but by dust and dirt.

In 1943, for instance, of the 75 tons per month, per square mile, 21 tons was smoke and 56 tons, dust and dirt. In 1948, the breakdown was 11 tons of smoke to 45 tons of dust and dirt, and in 1949, the first 9 months, an average per month of 10 tons of smoke to 40 tons of dust and dirt.

So now, what must be done is to concentrate on a cleaner Chicago generally. Everything pertaining to a cleaner Chicago has its effect on cleaner air.

CHAIRMAN LYON:

Our second speaker is Mr. Clyde Williams. He is the Director of the Battelle Memorial Institute in Columbus, Ohio.

The Battelle Institute is a scientific research organization which, among its many other functions, conducts research projects in the use of coal in stationary heating plants, metallurgical operations, railroad engines and power plants.

It is a pleasure to present Mr. Williams.

MR. CLYDE WILLIAMS:

The story of Chicago's "clean-up" program in inspiring. The results already achieved, as judged by a frequent visitor to the loop, bear evidence of its value. What I like most about it is that it is a plan organized and carried out by the people for their own health and comfort. It enlists cooperation and free enterprise, the two most essential factors for success in such an undertaking.

Paths to clean air in your city lie in combining these two factors (cooperation and enterprise) with understanding. And in a populated area so large and with such vast and diverse industrial activity as Chicago, the problem is most complex. It is fundamentally a problem in technology. It started when people first began to live in large communities and to burn coal.

As early as 1306, it is reported that Edward I issued a proclamation prohibiting the burning of coal in London. So the problem of abatement of coal smoke has been with us for a long time. As our civilization became increasingly industrialized, gases, fumes, dusts and dirt were added to the smoke to increase the amount of foreign materials in the air and the complexity of the problem.

Thus, for our increased comfort and enjoyment of life, we have paid the price of increased air pollution. But just as we encountered and solved our problems of sanitation, transportation and communications, so we will surmount this present and most trying one. In fact, we are making great strides toward its solution. In Chicago, you have made tremendous progress already. I am told that the dirt-fall as measured at various stations throughout the city has shown a substantial reduction in recent years.

You have approached the problem in a realistic way. You did well to establish a group to administer the ordinance under the able direction of Frank Chambers. He is recognized as one of the leaders in his field in the country. Your organization of the Cleaner Air Committee of the Chicago Association of Commerce and Industry was an excellent move.

Of course, advancement along the road to cleaner air means different things to different people. Some measure it by the haze or smog in the atmosphere or the amount of sunshine; others by the dirt that falls on the ground or settles in the house and on the furnishings. All these undesirable contaminants are caused by different factors, and weather conditions affect them materially.

Sulphur in fuel or in industrial waste products emitted in combination with oxygen, in contact with moisture, may cause the formation of nuclei with other foreign particles and give rise to the smog which intensifies unpleasant effect or ordinary smoke. Fly-ash from large heating plants and electric utilities, and small installations as well, fumes and dirt from manufacturing plants, cinders from locomotives, and dust blown from the ground of the city and even from great distances all contribute to the so-called dirt-fall.

The absence of wind or its failure to get near the earth's surface to sweep out or disperse the foreign material overlying the city further intensifies the problem. Often owing to the presence of a blanket of warm air above the cooler ground surface of the city, the normal rising air currents are absent. As a result, smoke or smog blankets the area or the dirt-fall is high, and the public blames the smoke inspector instead of the weather man.

It is in such situations when this meteorological lid is present to an extreme degree, that conditions damaging to health may develop. Fortunately, nature has endowed Chicago with a wind movement that minimizes such possibilities. In fact, in one way the frequent winds here simplify your problem immeasurably. But these same winds are responsible for stirring up the dirt on your streets and buildings, and for bringing in dust from afar.

Weather Is Factor

While we can do very little at present about the weather, we can reduce the emission of foreign materials into the atmosphere. Already important steps have been taken. Since products from the combustion of coal have been longest in the public's eye (and I say this advisedly), the most progress has been made in this field. It is to the credit of the coal producer and the larger users of coal that they have taken the leadership in this work.

The coal industry through its research agency, Bituminous Coal Research, Inc., has made numerous important contributions toward cleaner air. Noteworthy among these are the dedusting of coal, the development of a stove to burn any kind of coal smokelessly, the improvement of domestic stokers, and the use of jets blown over the fire to eliminate

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smoke in the larger heating units, including the firebox of the locomotive.

The railroads have attacked the problem on two fronts. First and most obviously, they have replaced large numbers of their coal-fired locomotives with Diesel engines. Second, they have adopted means for elimination of smoke from the coal-fired locomotive, such as the over-fire jets; and they have initiated a research project in cooperation with the coal industry to reduce the emission of cinders. Moreover, in anticipation of the eventual replacement of Diesel oil by coal, they have engaged in the development of a coal-fired gas turbine for use on locomotives.

Many railroad men likewise are interested in the joint study being made by the coal industry and the electric utilities of the feasibility of extending the electrification of the railroads.

The utilities have been one of the largest and most consistent users of coal. They also have been outstanding in their contributions to give us cleaner air. For example, the electric utility group has spent well over 50 million dollars for equipment to collect fly-ash from their pulverized-coal-fired boilers. Even more striking is the fact that the utility plants have installed about 80 per cent of the dust collector equipment in the country even though they burn only 20 per cent of the coal. The Commonwealth Edison Company here in Chicago deserves particular commendation in that they have gone even beyond the installation of fly-ash collectors. Through their cooperation with one of the largest boiler manufacturers, they have assisted in the development of a new method of combustion that catches and retains most of the fly-ash in a boiler furnace. This is an excellent example of how pollution can be greatly reduced or even eliminated by a change in process as contrasted to the installation of equipment to catch the mtaerials after it has been made. This same approach—prevention rather than cure—can be applied in many other industries. It may be used, for example, in blast furnace and steel plants, ferrous and nonferrous foundries and other metallurgical establishments.

The iron foundries already have a committee working in this direction. And the steel industry is organizing a comprehensive study of air pollution. As a result primarily of the difficulty in Los Angeles, the oil industry is now engaged in an ambitious research investigation of its problem.

These activities of industry are most helpful. I know they have your encouragement and support. They need more than this, however. They need to be made a part of a carefully developed plan of action. This plan should comprise the following three major parts:

Elements of Program

1. A program of research to ascertain the causes and effects of various kinds of air pollution and to determine their harmfulness. This research will tell you where to place emphasis in the abatement activities.

2. Selection of one or more methods for overcoming or reducing the nuisance in each case. This again will require much study and engineering development. It is essential if a workable plan is evolved.

3. A coordinated plan for achievement of the goal of clean air. To succeed, this plan must be practicable and it must be popular. It should not be restrictive in its effect on personal liberty or public economy. Like any form of prohibition, most of the people in a free economy have to want it or it fails. It will have to include an intelligent public relations program.

The research investigation mentioned as Part 1 above, to determine causes and effects of pollution and to evaluate them, obviously should be done before selecting any corrective measures. The first step is to find out just what dirt and other contaminants are actually present in the air, and the amount of each. When this has been done accurately, we can expect to judge the effects of the various kinds of pollution. For example, it will determine whether the present emphasis on elimination of smoke from coal-fired units is justified. It will require the development of improved sampling equipment.

This study also should evaluate in terms of dollars the cost of the various types of air pollution. In this regard, it is essential that we do not view with alarm statements regarding the effect of this factor on health. Irresponsible, frightening statements are harmful to the cause that we espouse. The most authoritative study I know of this subject was made by Dr. A. J. Lanza, Chairman, Council of Industrial Health, American Medical Association, and Chairman, Institute of Industrial Medicine, New York University. In speaking of the effects of discharge into the atmosphere of industrial fumes and gases, he said: "The amount of disability and mortality from these causes is exceedingly small, so small that it could not be identified in any statistical tabulation of the causes of death of disability."

The successful plan must embrace all the elements of a system designed to help the greatest number of people living together under a free economy. In short, it is typically a job for free enterprise.

Having a good plan of operation, its execution becomes of paramount importance. The household and small business are responsible for a large part of the smoke nuisance due to coal; industry, for much of the fumes and dirt-fall. Development of the proposed plan to give Chicago cleaner air must be based primarily on technological considerations. The solution will depend on engineering application.

Who Should Do Job?

Who then is best fitted to do this job? *The answer is industry.* And since industry has so much at stake, I say give the job to *industry.* Chicago is one city which has made a start in this direction through the establishment of the "Cleaner Air Committee of the Chicago Association of Commerce and Industry." For even more effective action, I propose that this facility be further extended and that a Board of Direction be given overall responsibility for the organization of a plan for cleaner air. This Board should comprise perhaps eight or ten top executives representing major industry such as steel, utility, railroad, coal, oil, foundry, fuel-burning equipment manufacturers, packinghouse and other large fuel users.

Initially this Board should develop the program of research to ascertain causes and effects of air pollution as it affects the Chicago area. Simultaneously it should appoint, from the various industrial groups mentioned, working committees made up of technical men with

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The Engineer Prepares for Management

A symposium representing industry, education, and personnel counselling sponsored by the Communications Section, November 7, 1949

Dr. Gustav Egloff, Moderator
Universal Oil Products Co.

Prof. Pierce Davis
Illinois Institute of Technology

Dr. Edwin D. Martin
Inland Steel Company

Dean Ovid W. Eshbach
Northwestern Technological Institute

Gifford B. West
Illinois Bell Telephone Co.

Wm. H. Harrison, Jr.
Social Research, Inc.

The engineer is becoming increasingly important in management, and it requires the best efforts of educational institutions and industry alike to enable him to successfully fulfill the broad responsibilities inherent in such positions.

As an individual, the engineer has the responsibility of improving his own status through study and participation in technical and social activities that will make him better suited for the task.

To explore the present situation and future possibilities, and to crystallize the diverse opinions on so important a subject, Western Society of Engineers invited representatives of industry, education and personnel counselling to participate in a panel discussion which would present the program of the schools and the companies, and study the needs as compared with the preparation.

"The Engineer Prepares for Management," was chosen as the subject, and on November 9, the five speakers sat down with Dr. Gustav Egloff, the moderator, before a capacity group of WSE members in the headquarters.

Dean Ovid W. Eshbach

First speaker was Dean Ovid W. Eshbach, of Northwestern University's Technological Institute.

Dean Eshbach described the undergraduate program of the technological schools, explaining, "The beginning point in engineering education is at 17½ to 18. In a four-year period we have certain things to do. We have to begin at the beginning and try to take the students to the point where industry and business want them."

Discussing the main goals of undergraduate engineering education, he said, first, that the prospective engineers must learn something about the physical world, the ideas that create the facts. They must have a thorough grounding in the principles of the sciences.

As the second goal he named the language of mathematics and the techniques of drawing. These two goals, he said, take up about three-fourths of the college time.

Twenty to twenty-five per cent of academic time is devoted to helping the student appreciate that there are other things than the technical . . . the human world, our common language, the beautiful thoughts expressed in the world's literature and arts.

In addition, Dean Eshbach emphasized the necessity for participation in campus affairs. This is a part of education, imparting a knowledge of the social atmosphere in which we live.

Prof. Pierce Davis

Professor Pierce Davis, Chairman of the Department of Industrial Engineering and the Department of Business and Economics, spoke on "What the graduate school does to prepare the engineer for industry." He stressed the importance of at least a minimum amount of general education as being extremely vital in management.

He continued, "We do not believe that an educational institution should try to train students for a particular business or profession." He recommended that they present the fundamentals of the sciences and of business, and leave to industry the training of students in the particular methods and procedures of the individual company.

Davis described the new curriculum at Illinois Institute of Technology which leads to the degree of Master of Science in Business and Engineering Administration. This three-semester program deals with business organization, market analysis, labor management, and theory and application of engineering problems.

The course is designed to make the engineering graduate more able to compete with people from other parts of the organization in the ascent to management levels.

Wm. H. Harrison, Jr.

Wm. H. Harrison, Jr., representing the personnel counselling field, is Director of Training for Social Research, Inc.

According to Mr. Harrison, "one of the needs of the engineer today, in order to fit him into the management picture, is to develop a basic understanding of the needs of workers. If the engineer is to be an effective member of the management team, he must understand the demands that people bring to the work situation. He must understand the needs for security, recognition, active participation, and a feeling of belonging. If he is to manage people,

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The Engineer Prepares For Management

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it is only with a thorough understanding of these concepts that he can be effective."

He continued, "In addition to this understanding of individuals, the engineer must also understand group behavior. Since man is basically a social being, he is primarily interested in being accepted by the members of his own group. These groups set up codes of behavior that do more than anything else to influence the attitudes of their members. It is these codes of behavior that lead to restriction of output, and, in more successful situations, to outstanding teamwork.

"A word about the young engineer," he added. "In my opinion, a number of our young engineers today are going into the business world with a very unreal picture of the situation that will confront them. They come out of our schools with a feeling that they are professional people and very often find that the demands of their job in no sense tax their technical know-how. It seems to me you could sum up the situation by saying that the engineer has expectations that far exceed the actual demands of his job upon entering industry."

Dr. Edwin D. Martin

Dr. Edwin D. Martin, Assistant Manager, Metallurgical and Inspection Department, Inland Steel Company, in summarizing his remarks for *Midwest Engineer,* stated:

"In the short time placed at our disposal, I should like to talk about what the steel industry does to prepare technical graduates for their work in industry, which may later include management. This can best be accomplished by considering what is done at the Inland Steel Company, with which I am most familiar, pointing out activities which are quite general in the steel industry and those that are specific to Inland Steel.

"Many of the major steel companies have more or less formalized training programs for college graduates. At the Inland Steel Company we have several. These include the Inland Training Group, Mill Trainee Program, Sales Trainee Program, Metallurgical Trainee Program and various departmental trainee programs."

"For the Inland Training Group," he said, "we carefully select eight to twelve young men who by grades attained in college, by extracurricular activities, personality and character are thought by our interviewers to be outstanding. The young men spend 52 weeks together as a group, which is divided for scheduling into sections."

For this group the Metallurgical and Inspection Department acts as a coordinating center. Two weeks are spent in orientation under the direct supervision of this department. Fifty weeks are then spent in various producing and service departments with periodic returns for one day of orientation in the Metallurgical and Inspection Department and finally three weeks are spent in this department for further study of its functioning and to tie ends together.

The Mill Trainee Program has been developed for selected college graduates whose main interest is production. From three to four men a year receive training as individuals, not as a class group, at our Indiana Harbor Works for a period of 35 weeks.

The Sales Trainee program is designed for selected college graduates whose main interest is in sales. A sufficient number to meet anticipated requirements, usually three or four men a year, are put through a program lasting 27 weeks as individuals with no definite starting time.

The Metallurgical Trainee Program, with about six men in training at all times, aims to develop selected graduates of technical schools strong in metallurgy, basic science and engineering into material for the research, metallurgical, chemical and inspection sides of our business. This course lasts 44 weeks.

"In addition, we have other departmental training programs in which selected college graduates are moved about on a relatively informal basis."

In the training programs outlined so far there are normally enrolled a total of about 24 college graduates a year.

In the past and at present, basic steel companies have maintained an Open Hearth Inspection Crew as a training ground for college graduates. At Inland Steel we have such a group of men in the Metallurgical and Inspection Department working in the Open Hearth Department. They start as Metallurgists, 4th Class, and are stepped up every six months, with increases in pay, to Metallurgists 1st Class. One day a week problems are reviewed and instruction given. The men are under a seasoned metallurgist and through their daily contacts learn the point of view of labor.

"At Inland Steel we have some cooperative students from the University of Cincinnati who work in pairs so that the job is always manned while the individual men alternate at school and on the job."

Inland-Purdue Program

Mention should be made of a unique program worked out at Inland Steel that represents a pioneering effort between our company and Purdue University. The men are not college graduates but are selected high school graduates who are given the opportunity for study at the college level while working. It is really a plan for advanced vocational training but stresses fundamental mathematics, physics and chemistry. Credits are issued toward a degree from the Purdue Technological Institute of Purdue University of Hammond, Indiana. This is definitely not so-called "on-the-job" training or apprentice training. Inland pays for books, tuition, and other fees. The man goes to classes one day a week on one of his "off" days and arrangements on the job are made so that he can do so.

The course lasts two years and credits received may be applied toward an Institute diploma, regularly granted to full-time students who have completed two years of study. There are three groups: Steelmaking, Metallurgy and Practice; Mechanical Technology; Electrical Technology. Regular "catalog" courses were jointly developed by Purdue and Inland. Inland men give some of the instruction and Inland supplies demonstration equipment where possible. At present 259 men are enrolled.

"We believe that the Inland Steel Company has been progressive in setting up these various programs for training college graduates and high school graduates at the lower college level and are confident that many young men, as well as

the company, will derive great benefit from them.

Gifford B. West

Gifford B. West, Chief Engineer of the Chicago Area, Illinois Bell Telephone Company, introduced his views on education for engineers by stating, "My experience does not admit of any predestination toward success. There are certain special aptnesses that help and also certain elements of luck. The only sure ways that I know of, however, are a well rounded preparedness toward any opportunity; the recognition and acceptance of the least chance; the ability to grow in consequence of the least upward step."

"For these and certain humanitarian reasons," he continued, "I am a strong advocate of post-collegiate education for engineers along non-technical lines to insure both a continuous growth of the mind and a continuous illumination of life. In my opinion, to be successful such education should be offered to adult engineers under field conditions, by qualified instructors and under the same disciplines as hold for collegiate degrees.

"This is no disparagement of what the schools are now doing, but because, in the words of John Dewey, 'the schools can provide only the instrumentalities toward mental growth; the rest depends upon our subsequent absorptions and the interpretations of our experiences.' "

"Engineering of today," he said, "is not so much a specialized, as a general, profession—the natural training preference, because of its practicality, of a very large proportion of our present and coming generations. We must admit that for these entrants the path toward the higher awards is crowded; that the competition is intense; and that the schools and managements must prepare and enter many more candidates than there can ever be higher posts to be filled."

He recommended an additional later course that is broad enough to prepare the man for advancement if opportunity occurs and can at the same time afford the means for self-improvement and self-esteem if opportunity is still deferred, as practicable and humanitarian. "It is my view," he said, "that the schools and engineering societies can jointly work it out and directly owe this duty to their common constituents."

Describing the system in his own company, he stated, "The full scope of any such program is beyond the range of any in-plant training but the Bell System has, for quite some time, been engaged in formally planned and executed instruction along the lines of interdepartmental training—conducting of meetings—supervisory training and, last but not least, the field of human relations. None of these can be classed as altruistic, for the proper development and maintenance of leadership qualities among its people is a prime requisite towards its overall System efficiencies.

"The Human-Relations course for supervisors is held in nine weekly one-day sessions plus homework. In a very brief preliminary workout it was dubbed 'The Charm School.' Even in its present full dress formality it might well be called 'The Facts of Life' course.

"Very briefly, it starts with the cause-result approach toward remedial actions in problems involving human behaviour. It develops interviewing as the most practical way of knowing and understanding each other. It deals briefly but competently with motivation and frustration and the factors within personal attitudes.

"With these out of the way it treats of the reactions upon people of each other and the actuality and significances of differences in individuality.

"As a whole it brings home an appreciation of the condition that we have no innate standing in the general scheme of life just because we are individual entities, but rather that our value in the world is because our personal existence has a worthwhile reaction upon the animate and inanimate things about us."

He continued, "In the Chicago Engineering department an epitome of the course is given in nine weekly half-day sessions to everybody, engineering and clerical, men and women together. It is extremely worthwhile.

"Our interdepartmental training program devotes twelve weeks to time spent in other departments, observing the work operations and participating in them as much as this is practical. The objective is to provide a better sense of proportion and a proper perspective toward the whole of the System.

"In the supervisory courses the objectives are those of development of individual ability toward effective group accomplishment, the efficiencies of sound planning and the art of receiving and delegating authority with mutual confidence and trust.

"The course in conference leading, due to its basic principles of control and guidance of people's thoughts and reactions is an application in different form, of the human relations course, although here the specific intent is to avoid confusion of mere authority with ability to handle people not otherwise subject to it.

"With these and other possible aids toward eventual engineering success," he said, "it must be remembered that such success is measurable in terms of financial, professional, social and ethical gains in accordance with the aspirations of the individual and the make-up of his associate group. Some one has said, however, that 'the reason for human existence is the development of human beings to the fullest possible potentials of character, personality and service.' "

"On this basis it should be worth our while to give our full aid to self-development factors regardless of whether or not the individual finally receives any public accolade," he concluded.

Gustav Egloff

Dr. Gustav Egloff, Director of Research, Universal Oil Products Company, and WSE President, was moderator of the panel. During the discussion following the speakers' statements, Dr. Egloff stressed the need for a longer program of study, suggesting that six or seven years of academic work would allow a much broader curriculum. He urged more men to study for the Ph.D. degree.

As for specific courses, he recommended a better background in English to give the young engineer greater facility in writing and speaking, and more work in public speaking to rid him of his "innate shyness."

Dr. Egloff also expressed the opinion that the young engineer would do well to assume a more humble attitude when he is interviewed for a position, so that he does not give the impression of thinking that he knows all the answers.

U. S. Public Health Service Creates New Engineering Division

Federal Security Administrator Oscar R. Ewing today announced the creation of a new division in the Bureau of State Services, Public Health Service, to be known as the Division of Engineering Resources.

At the same time, Mr. Ewing made public the appointment of M. Allen Pond, Assistant Chief Sanitary Engineer of the Public Health Service, as chief of the new division.

Surgeon General Leonard A. Scheele said the Division of Engineering Resources will centralize planning and development of current and proposed programs of the Public Health Service in the expanding field of sanitary engineering and environmental health.

"In the present state of rapid development in the sanitary engineering field," Dr. Scheele said, "it appears essential that a division whose major activity is planning and development should be established."

To Study Environment

Dr. Scheele described the purpose of the new division as being "to evaluate activities and more clearly delineate needs in environmental health."

Its creation, he said, is in keeping with steps now underway to enlarge the scope of environmental health activities in the Public Health Service.

Dr. Scheele said that the new division also will be responsible for the development of a program in radiological health and that it will consult with State and local health officials on the prevention and control of health hazards arising out of the use of radiation-producing equipment and radioactive materials.

The head of the new division has been with the Public Health Service since 1942, with the exception of an interval between 1946 and 1948, when he served as Assistant Professor of Public Health at Yale University.

A graduate of Yale, Mr. Pond holds Bachelor of Science and Master of Public Health degrees from that university.

Award John Fritz, Guggenheim Medals

Walter Hull Aldridge was elected to receive the John Fritz medal for 1949, one of the highest awards in the engineering profession, it was announced today by Edgar M. Hastings, chairman of the John Fritz Medal Board of Award.

Mr. Aldridge has been president of the Texas Gulf Sulphur Company for more than thirty years, is a trustee of Columbia University, and holder of the honorary degree doctor of science and other honors.

He is cited for the present award as "engineer of mines and statesman of industry who by his rare technical and administrative skills has importantly augmented the mineral production of our country and Canada."

The John Fritz Medal and certificate are presented not more often than once each year "for scientific or industrial achievement" in any field of pure or applied science. It was established in 1902 as a memorial to the great engineer and steel maker whose name it bears, and is jointly sponsored by the Founder Societies of civil, mining, mechanical and electrical engineers. The roster of John Fritz medalists includes the names of some of the world's most illustrious engineers and scientists—Westinghouse, Alexander Graham Bell, Edison, General Goethals, Orville Wright, Marconi, Sperry, Hoover, Pupin, Kettering and others.

Edward Pearson Warner has been elected to receive the Daniel Guggenheim medal and certificate for 1950 for "pioneering in research and a continuous record of contributions to the art and science of aeronautics," Glenn Martin, chairman of the Medal Board, announced today.

Dr. Warner is president of the Interim Council of Provisional International Civil Aviation Organization and has held many government posts in the aeronautical field.

The Daniel Guggenheim Medal was created for the purpose of honoring persons who make notable achievements in the advancement of aeronautics. Provision for the medal was made in 1928 by the gift of a fund from the Daniel Guggenheim Fund for the Promotion of Aeronautics. Some previous recipients of this medal are Orville Wright, Boeing, Douglas, Martin, General Doolittle, Bell, Grumman.

Obituaries

Edmund O. Schweitzer (M'19), and added to the WSE Life Member roster May, 1949, died September 22. He was retired chief testing engineer for Commonwealth Edison Company, and was part owner and former president of Schweitzer and Conrad, Inc., an electrical manufacturing firm.

* * *

Andrew Christy (M'41), died September 8. He was a physicist with the University of Chicago, and had been Director of Research of G M Laboratories, Inc. for many years.

* * *

Ivan S. Rice (M'40), a maintenance engineer with Commonwealth Edison Company, died August 11. He has been active on the membership committee from 1940 to 1943.

* * *

A. J. Bain (M'26), died September 17 in Atlanta, Georgia, where he had lived since 1942. He was a Colonel in the U. S. Army, and upon his retirement after World War II, had been a consulting civil engineer.

* * *

Denney W. Roper (M'05) and a Life Member of WSE, died October 5, in Carmel, California, where he had lived since his retirement from Commonwealth Edison Company.

He served as first vice-president from 1916-18, and as second vice-president in 1916.

* * *

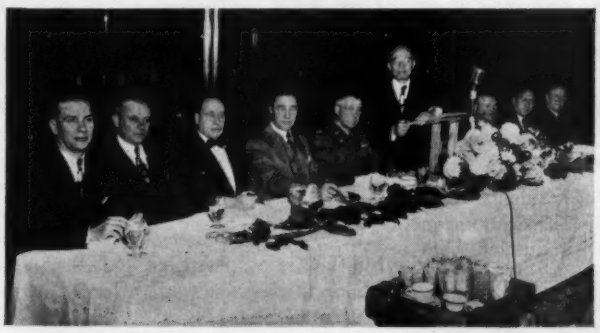
Vernon E. Hupp (M'44), a heating and ventilating engineer with the Chicago Park District, died October 8.

East 130th Street Bridge Open

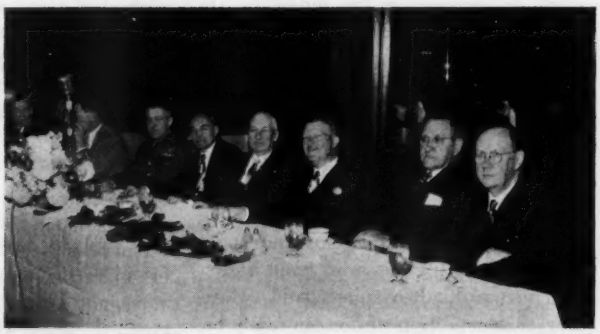
The Department of Public Works of the City of Chicago has announced the opening for service of the East 130th Street Fixed Bridge over the Calumet River on Saturday, December 3, 1949.

General View of the Ballroom showing screen in place for the photographic highlight of the evening presented by Col. George A. Goddard, Wright Field. The speakers table is at right.

Annual Fall Dinner of WSE



Seated at the Speakers' Table are, left to right, Leroy F. Bernhard, Fred T. Sonne, Verne O. McClurg, William V. Kahler, Col. George Goddard, President Gustav Egloff, Ralph Budd (hidden), Fred T. Whiting, Ludwig Skog, Donald N. Becker.



Another view of the Speaker's Table showing, right to left, Donald N. Becker, Ludwig Skog, Fred T. Whiting, Ralph Budd, President Gustav Egloff, Col. George Goddard, William V. Kahler, Fred T. Sonne, and Leroy F. Bernhard.

Advances in Plant Operating Safety

Col. Thomas F. Brown
Vice President, National Distillers Products Corp.

Presented in the New York Journal of Commerce, November 18, 1949

Year after year, old—and new—perplexities continually confront the distilling industry. These problems affecting the future welfare of the spirits business arise in every field of the industry. But nowhere are they more pronounced than in the field of production, where safety and man-power are of paramount importance.

The past year, in this respect, was no different from those that preceded it. Yet the distilled spirits industry, either individually or jointly, made significant progress along many lines. Not all of our common obstacles have been overcome, but if advances have been slow in some undertakings, the industry at least developed the proper method or the right approach which promised an ultimate solution.

Past Record

Years ago, before "the safety era" in the distilled spirits industry, it was not uncommon for an individual distiller to experience upwards of 40 disabling injuries per million man hours worked. This needless death and injury while working can be attributed to a number of factors. One reason was a lack of real safety-mindedness in the industry. Another was carelessness. And not only carelessness on the part of the employee, but also carelessness at all levels of the industry.

This condition was not confined to distillers of spirits. Unfortunately, it was too general throughout American business and industry. In many industries the death and injuries were even higher than in the distilled spirits field. However, that condition no longer exists because both employee and employer awakened to this disturbing situation and decided to do something about it.

For these appalling losses, the distilled spirits industry must assume its share of responsibility. But it is a small share, due to our industry's awakening more than a decade ago. We awoke to the fact that lives could be saved and injuries prevented through foresight and work by an understanding management and a safety-conscious employee.

And we found, to the amazement of our industry, that an accident was like an atomic explosion. There was a chain reaction. A single accident, in itself, was a bad thing.

But an injurious accident that maims an employee frequently causing the loss or impairment of an experienced and valued worker, is far worse. Such occurrences undermine employee morale, inspire fear and dissatisfaction and lower efficiency. Nor do these primary factors take into consideration the fact that every accident generally means not only the loss of the injured worker's time but also the time of 10 or 15 fellow-employees who, either out of curiosity or in an effort to help, may watch for 15 minutes. This adds up to 300 minutes or five hours working time lost. And finally there is the damage or loss to the physical plant, resulting in added operating costs for repairs, replacements. There is also another adverse product of accidents—the effect on the community. This cannot be measured in dollars, but the cost is considerable in lower community morale, economic loss, and declining public opinion and support.

The sum total cost of accidents, therefore, included not only these important factors, but also lower production, higher operating costs, increased insurance rates, and greater outlays for workmen's compensation. Ultimately, the public suffered because these increased costs were passed on to the consumer in whole or in part.

Our industry's awakening to "the safety era" produced unexpected benefits for all concerned. In 1948, the disabling injuries per million man hours worked totaled 11.49 for all American industry. But the distilling industry rate was 9.2.

And this year, in the National Safety Council's safety contest, the first 12 contestants out of 14 entered in Group A Division of the brewed and distilled beverages section, were below the national average of disabling injuries. So, too, were the first 18 entrants out of 21 contestants in the Group B section of the same division.

Notes Accomplishments

How were these accomplishments attained? That, I think, is typified by National Distillers Products Corporation, whose Louisville division won first place in the Group A division with a record of only 1.03 disabling injuries per million man hours worked during the Safety Council's contest year. In addition, 5 other divisions entered in the contest by National Distillers finished the year well below the distilling industry's 1948 national average of 9.2.

This showing by National Distillers can only be attributed to three things. First, we are fortunate in having a top management, headed by Seton Porter, President and Chairman of the Board, which is intensely safety-minded. Secondly, our employees cooperate enthusiastically in our joint objective to prevent accidents. And third, we have initiated and developed a comprehensive program of accident prevention and safety education under direction of a full-time safety engineer, J. J. Prabulos, who in the last war was a safety officer in the United States Navy.

Our program of accident prevention has produced results and we have found that as our safety organization grew and

improved, injuries to employees decreased and lost time frequencies gradually diminished. Our employees' knowledge that the management was safety-minded has been a big factor in winning their cooperation. Many other distillers have had similar experiences.

In the case of National Distillers, accident prevention and safety education have engendered a much better morale among employees. And management seizes every opportunity to maintain worker morale at a high level. For example, we employ the latest safety devices such as respirators and ventilators to protect workers from dust and fumes. We also take great care to see that, where possible, employees are shielded by guards on all dangerous machinery and moving parts of mechanical units. We also supply workers with such protective equipment as face shields, goggles, gloves, rubber aprons, and boots. We are constantly alert to improve methods and techniques in the handling of materials, especially caustics and acids to protect workers against exposure to chemicals.

Committees Formed

All plants have a first aid room, staffed by either a registered nurse or an experienced first aid attendant. And, to indoctrinate our employees in safety, National Distillers employs six safety directors at its plants. Working safety committees include employee, supervisor, and plant safety groups.

These committees meet individually every month—on company time—at which times suggestions for improvements are made and physical hazards and unsafe conditions in a plant are reported and discussed. Safety is made an ever-constant topic with caution signs, bulletin boards—many of which are illuminated—and slogans placed at strategic locations in the plants to catch the employee's attention.

An integral part of our safety program is the friendly inter-plant rivalry that has developed as our accident prevention work expanded. The spirit of competition, the determination to do better than the other fellow is an important essential in the success of National Distillers' safety work.

This competition is encouraged and stimulated wherever possible. Our safety engineers conduct safety contests between individual plants and between individual company divisions into which the various plant units are grouped.

An important part of this phase of the work is a series of slogan contests for all employees. Cash prizes are awarded writers of the winning slogans. The slogans and the names of the two top winners are used on large illustrated colored posters which are prominently displayed at all the plants. In addition, these posters, which are changed monthly, also carry the standings of individual plants in the current accident prevention contests. So popular has our slogan contest become that more than half of all our production workers now participate. We also have made it a matter of practice to have annual safety meetings with safety leaders for discussion of program improvements and an exchange of ideas.

Sound slide films, motion pictures and short talks on safety are regularly employed as are monthly fire drills, fire prevention schools and first aid training classes open to all employees who are instructed by a qualified Red Cross instructor.

First aid training is mandatory for all of National's plant protection employees. All our supervisors are encouraged to take first aid instruction. This type of training also is open to all of our other employees but is not compulsory for them.

In our plants located in rural areas, we maintain our own fire brigades and in all plants our plant protection forces are thoroughly grounded in fire fighting.

Employee Training

National Distillers' safety program begins with the first day a new employee starts to work. At that time he or she is given a small booklet which sets forth the essentials of safety. And training and caution is a daily occurrence thereafter. We also invite State agencies and compensation officers to inspect our plants and make recommendations for improvements to guard against accidents. It is fundamental that accidents frequently cause injury to individual employees and usually result in damage to plant equipment.

Therefore, we at National Distillers attempt to inculcate in every employee the ability to think of two things at once: his or her safety, and his or her job. Our accident prevention training and safety education emphasize how much better it is to do things this or that way rather than telling employees they cannot do this or that.

It has been our experience, as it has been the experience of the distilled spirits industry, that safety work and accident prevention pays. It pays not only in eradicating human suffering, but also in lower compensation costs and insurance rates, more efficient production and fewer expenditures for repairs. Without a safety program, the industry insurance probably would be considerably higher. In the cases of some individual companies, the rates certainly would be five or six times as high as they are today.

We and the other members of the industry still have a long way to go in safety work. But we have made astonishing gains in the prevention of accidents, which, in the final analysis, are basically caused by a lack of safety consciousness.

Develop New Blasting Caps

Reduction of vibration from blasting operations carried on near populated areas is made possible by a new line of fractional-second delay electric blasting caps. Instead of firing one large charge of explosives at one time and setting up one large shock wave, it is possible with the use of the new fractional-second blasting caps to break up a large charge into smaller portions and fire each portion at fractional-second intervals.

Announcement of this new line of Western Minimax electric blasting caps was made by F. S. Elfred, general manager of the Explosives Division of Olin Industries, Inc.

The new fractional-second caps are accurately timed, are of one-piece, all-metal construction and are supplied in 10 periods of delay. Eleven-delay periods can be obtained by using the caps in combination with the Western Zero ventless delay blasting cap. Caps are identified with their respective delay number, and are supplied with plastic covered wires and plastic shunts.

Described as producing increased blasting efficiency and reduced blasting expense, the new Minimax caps are ventless and waterproofed. Having a one-piece single diameter shell, the new caps simplify the making up of a primer cartridge.

HERBERT HOOVER

Will Receive Award for Outstanding Contribution To Construction, for Service as Citizen

Former President of the United States Herbert Hoover (WSE) will receive the tenth annual Moles Award for outstanding contribution to construction and for his exemplary career as a citizen, according to Carlton S. Proctor, President of The Moles, an association of leaders in America's heavy construction industry.

As established in 1941, the award goes each year to one non-member and one member of The Moles. For 1950, Mr. Hoover is the non-member recipient, in recognition of his long career in public service, the example he has set in inspiring the ideals of individual enterprise and personal freedom and for his accomplishments in the engineering profession.

In previous years non-members honored by The Moles include Robert Moses, chairman of the Triborough Bridge and Tunnel Authority, New York, and New York City Construction Coordinator; General Brehon Somerville (retired), wartime Chief of the Army Service Forces; Admiral Ben Moreell (retired), wartime commander of the Seabees; Lieutenant-General Raymond A. Wheeler (retired), former Chief of Engineers, U. S. Army, and the late Frank T. Crowe, constructor of the Hoover, Shasta and other large dams.

Members receiving the Moles Award in the past include Captain Thomas A. Scott, chairman of the board of Merritt-Chapman & Scott Corporation, one of the nation's largest construction firms; William A. Durkin, builder of the Queens-Midtown Vehicular Tunnel, New York, and other important tunnel projects; Arthur A. Johnson, whose firm prepared the New York World's Fair site and built sections of the New York City subway, and William B. McMenimen, head of a contracting group which built a billion dollars worth of Pacific naval bases during the recent war.

In discussing Mr. Hoover's award, Mr. Proctor said, "Our immediate incentive for honoring Mr. Hoover is in recognition of his priceless service as chairman of the Commission on Organization of the Executive Branch of the Government. The Hoover Commission, as it is more familiarly known, made a painstaking investigation of the executive branch and has recommended the many sweeping reforms so urgently needed to increase our government's operating efficiency and to reduce unnecessary expenses. Mr. Hoover not only developed sound plans for operating the executive but also directed public attention to the need for these reforms without partisanship or rancor.

"There is no doubt that these reforms, many of which have already been adopted, will have a salutary effect on the construction field, as well as all industry, through general economies and in streamlining the means by which the government and private enterprise work together. Beyond this consideration, the award expresses our admiration for his lifelong inspiration of those ideals of individual initiative and personal freedom which have brought this country world leadership. The construction industry stands for that kind of individual effort and in these times of flux and the stress of conflicting ideas, Mr. Hoover's tireless and courageous advancement of the American tradition is an example to all of us. We of The Moles naturally sense a bond or comradeship with Mr. Hoover in view of his achievements as a mining engineer, as a builder of important mining and terminal installations and as a mining consultant around the world."

Herbert Hoover

The Moles derives its name from the fact that much heavy construction work is carried on underground or under water, and its members are engaged in dredging, salvage and building tunnels, bridge, dam and large building foundations, sewage projects, subways, conduits and marine installations. Membership is limited to 375 men, the preponderance being drawn from New York.

Hoover was the first recipient of the Washington Award, given to him in 1919 for his achievements as Chairman of the Commission for Relief of Belgium, 1914-17, and as Food Administrator of the United States, 1917-18. He was awarded an Honorary Membership in WSE in 1926.

ATTENTION, WORLD WAR II OFFICERS AND ENLISTED MEN

Reserve and former Army, Air Force and Naval officers and enlisted men now are privileged to belong to a Western Society of Engineers sponsored reserve unit.

The Western Society of Engineers has accepted the invitation of the U. S. Army Division Engineer to act as co-sponsor of a RESERVE CORPS ENGINEER CONSTRUCTION BRIGADE HEADQUARTERS to consist of 39 officers and 166 enlisted men. Only officer personnel will be selected at this time.

Previous branch of service is immaterial. Selection will be made on the basis of present qualifications for service in the Engineers to which TRANSFERS CAN BE EFFECTED FROM ANY BRANCH OF SERVICE.

This Engineer Construction Brigade will be the top level construction unit of the Army Reserve in this area. In active service it plans and controls the Engineer phases of large operations and includes in its roster assignments for specialists in all fields of engineering including civil, architectural, railway, highway, hydraulic and sanitary, electrical, mechanical and petroleum engineering.

Membership in this unit offers many advantages not available to members of other reserve units not the least of which are:

PRESTIGE

No other unit in this area offers the prestige associated with membership in this top level unit with your fellow WSE members.

CENTRAL MEETING PLACE

Membership involves attendance at semi-monthly 2-hour conferences at WSE headquarters, 84 E. Randolph Street, convenient to all means of local transportation, including the outer drive.

PAY FOR DRILLS— RETIREMENT BENEFITS

This is a TO&E unit and receives top priority in number of pay drills. Each member receives one day's pay at the regular rate for his grade for each drill or conference attended and each attendance counts toward the government pension payable under certain conditions at age 60.

PLENTY OF "BRASS"

Officer grades are as follows:

1 Brigadier General
1 Colonel
1 Lieutenant Colonel
16 Majors
15 Captains
5 Lieutenants

All WSE members with previous commissioned or enlisted military or naval service are cordially invited to attend the initial organization meeting in the small auditorium at the WSE Headquarters, December 20 at 7 p.m. Colonel Hardin, Great Lakes Division Engineer, will be present to assist the committee in further explanation of the details.

The enlarged program of the Army Reserve Corps warrants your active support. Save the date now and plan to attend the meeting. This is your best opportunity to join a top level Engineer Reserve Unit.

Fill in the blank below and return it to Western Society of Engineers, 84 E. Randolph Street *NOW*.

Gustav Egloff
President

I will attend the Reserve Corps Meeting Dec. 20, 1949.

Name_____

Mail Address_____ Tel._____

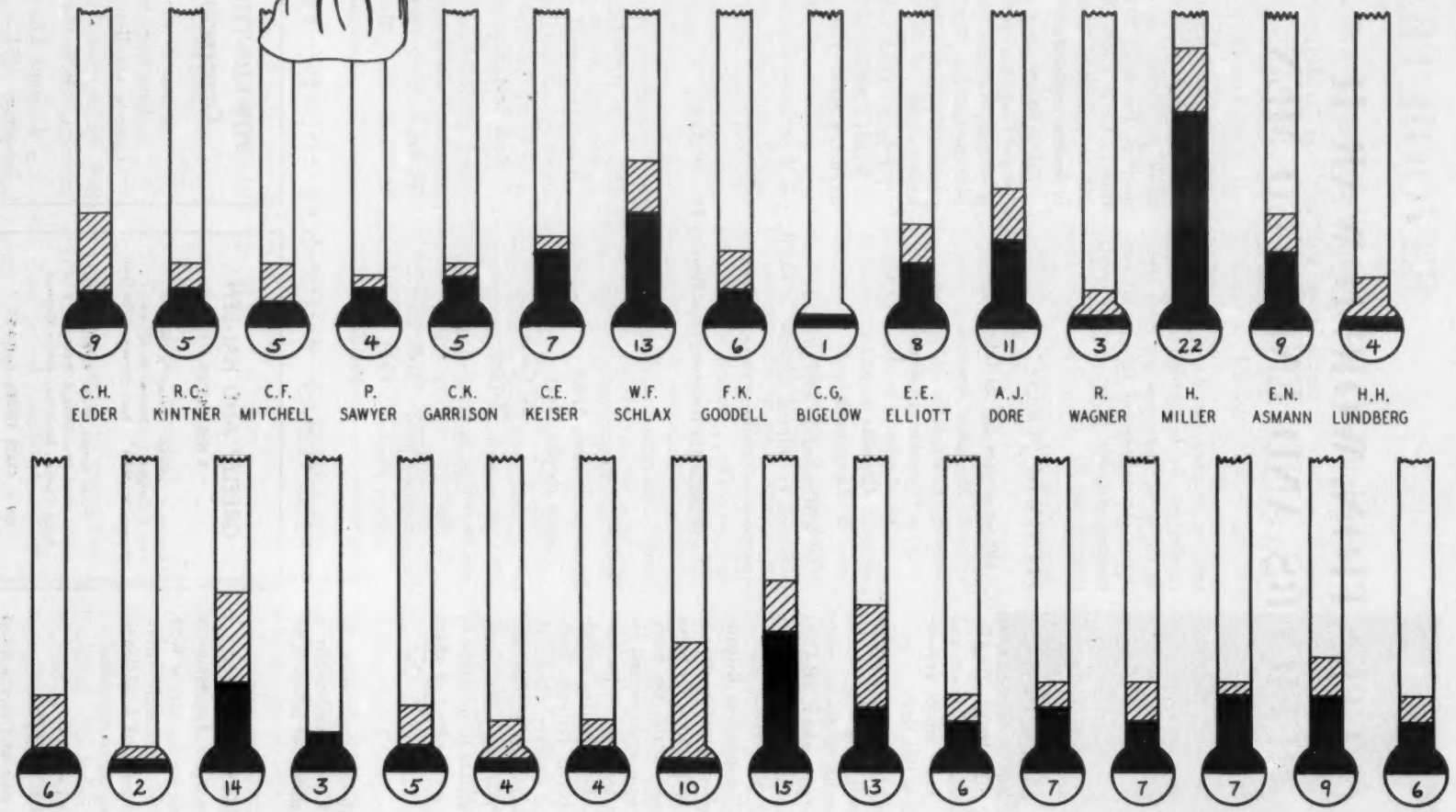
Previous Service: (please check) Army _____ Navy _____ Air Corps _____ Marines _____ Rank held_____

I am not / I am a member of the Reserves.

Present employment: (please check) Arch. Engr._____ Civ. Engr._____ Chem. Engr._____ Elect. Engr._____ H&S Engr._____ Mech. Engr._____ Pet. Engr._____

WESTERN SOCIETY OF ENGINEERS
MEMBERSHIP DRIVE
(RELATIVE ACTIVITY CHART)

219
NEW APPLICATIONS (TO NOVEMBER 16, 1949)



ADDED THIS MONTH

TOTAL TO LAST MONTH

Santa Claus is Coming!

TO SEE THESE MEMBERS . . . AND THE NEW MEMBERS THEY'VE OBTAINED.

Allen, A. G.*
Anderson, Bolton G.
Anderson, R. E.*
Artman, Mrs. M. E.

Bailey, G. G.
Balkin, S. F.
Becker, Donald N.
Benoit, Wm.*
Bernhard, Leroy F.
Brewer, A. H.*
Bradley, B.*
Burt, George H.
Buxton, B. L.
Beattie, C. S.

Carlson, A. C.
Carlson, W. W.
Culp, E. R.

Dartsch, F. A. L.
Davies, F. C.
DeLeuw, C. E.
DeWolfe, E. C.
Doyle, T. M.*

Egloff, Gustav
Elder, Clarence H.
Elliott, E. E.

Epstein, A.*

Fischer, David J.
Flood, Paul*
Fredrick, T. C.

Gabbard, L. C.
Garrison, C. K.*
Goodell, F. K.*
Gordon, B. A.*
Graham, I. E.
Gray, Walter
Guthrie, R. M.
Griesel, Margaret*

Hall, George S.*
Halperin, Herman
Halvorsen, Ralph*
Hanson, C. D.
Hanson, R. M.*
Holt, N. C.*
Howson, A. W.*
Hecht, J. L.
Herr, C. C.
Horneman, Miss B.
Huff, Julius*
Humiston, J. F.

Jackson, A. L.
Jelinek, O. K.
Johnson, Elmer A.*

Kahler, W. W.
Kawiecki, C. J.
Keith, A. W.
Kelly, R. R.
Kerr, A.
Kintner, R. C.*
Klammer, K. K.*
Kraft, John E.*
Kucho, Joseph

Langdon, L. E.*
Larson, M. N.*
LeClair, Titus G.
Lockwood, L. E.

McKee, K. E.
McLean, C. J.
Maney, F.
Marsh, Edward J.
Marston, W. R.
Mee, C. L.
Melnick, T.
Michaels, E. E.
Miller, Herbert R.
Mitchell, Chester F.*
Murphy, Miss M. L.

Nielsen, E. R.*

Orloff, Melvin*

Perkins, Miss R.
Peterson, Ralph S.
Pillsbury, C. S.*

Randall, Edwin A.
Rettaliata, J.*
Rivenes, A.*
Rogers, D. E.*
Ruzich, J. L.

St. Germaine, A.
Salzman, A. L.
Sargent, Ralph
Saunders, N. H.
Sawyer, Percy
Scaar, Harry*
Schick, N.
Schirmer, R. W.
Schlesinger, L.*
Schoonover, Howard
Schmitz, C. E.
Scopelite, J.*
Sedwick, H. P.
Seymour, C. W.
Sikes, A. W.*
Showtis, B. M.*
Simpson, G. N.
Skog, L.
Smith, D. L.

Smith, F. C.
Sommerschield, H. F.
Spencer, A. L.*
Strazz, A. J.
Sykes, Wilfred

Taylor, O. H.
Tornquist, E. L.
Tuttle, L. W.

Vanderkolk, W. W.

Wade, J. William
Walker, C. W.
Weeks, L. E.
Whitehead, E.*
Whiting, F.
Wier, R. J.
Wilkins, D. C.
Williams, G. M.
Williams, Kenneth
Willet, G. R.*
Wisner, G. F. Jr.
Wolfe, Thomas
Wilson, J. R.*
Woloshin, Boris

Zermuehlen, H.*

*Since last period

They've been good, Santa

DE BERARD TO BE HONORED

City Engineer, WSE Life Member, Will Receive ASCE Honorary Membership

W. W. DeBerard (WSE), City Engineer of Chicago since 1941, will be awarded an honorary membership in the American Society of Civil Engineers at the society's annual meeting in New York in January.

Mr. DeBerard, who was Western Editor of *Engineering News-Record* for 25 years before his appointment as City Engineer, was born in Fairfax, Iowa, and graduated from Beloit College and M.I.T.

His first experience in the field of water supply and purification—which continues as his major interest—was in the three-year period between his graduation from Beloit College and his entrance to M.I.T., when he served as chemist and bacteriologist with the Denver Union Water Company in the building of the first comprehensive water laboratory west of the Mississippi River.

Following his graduation from M.I.T., DeBerard spent two years with the Philadelphia Water department on the investigation of pre-treatment of water before applying to slow sand filters. He then spent another two years at Harrisburg, Pa., where experiments on preliminary treatment of water were continued, and a 12 mgd. filtration plant constructed.

After assignments at Columbus, Ohio; Oakland, California; Denver, Colorado; and New York City, he began his association with *Engineering Record*, which was to become *Engineering News-Record*. This association continued to 1941, except for two short periods,

W. W. DeBerard

when he was granted leaves of absence to act as Chief Engineer for the Chicago Regional Planning Association (1926-27), and as a member of the Sanitary District of Chicago Engineering Board of Review (1928).

Since 1941, when Mr. DeBerard became City Engineer of Chicago, he has been particularly active in the improvement of the water supply and distribution for the City and in the modernization of its bridge facilities. During this period, the 320 mgd. South District Filtration Plant, costing about $26,000,000, was completed and put in operation. This plant, the largest of its type, serves the south one-third of the city. Studies are now being made and plans prepared for a 950 mgd. plant, which will serve the remainder of the city and many of its suburbs.

In carrying out his conception of an engineer's responsibility to his profession, Mr. DeBerard has been active in many organizations. An associate member of the American Society of Civil Engineers since 1906, and a full member since 1926, he served as a Director in 1938-40, and President of the Illinois Section in 1933.

He served as a Director of WSE's Traffic Engineering and City Planning Section in 1939-40, and was Chairman of the Section in 1942-43. He was Chairman of the Engineering History Division in 1944-45, and was a WSE representative on the Washington Award Commission from 1935 to 1937, and from 1947 to 1949.

He is a Life Member of the Western Society of Engineers and has served the Society as a Director and Vice President. He is an Honorary Member of the American Water Works Association and has served as Director and President of the Illinois Section of that organization. He was one of the founders of the Federation of Sewage Works Association and has been its Treasurer since its inception. He is a member of the Central States Sewage Works Association, the American Association of Engineers, the American Society of Sanitary Engineering, and an Associate Member, and member of the Highway Research Board, of the American Road Builders Association.

Mr. DeBerard has a Life membership in the Chicago Engineers' Club, of which he served as Director in 1935-37.

In spite of the limitations imposed by wartime conditions, during the eight year period Mr. DeBerard has served as City Engineer, he has supervised the construction of two major bridges and the world's largest filtration plant, and has directed improvements in the water distribution system which have greatly reduced leakage and unaccounted-for-water. The two city departments under his charge have approximately 3,000 employees, with an annual budget of 28 million dollars for operation, maintenance, and new construction.

CRERAR LIBRARY Notes and News

Numerous readers have suggested that the number of periodicals which must be supplied from the book stacks since the transfer of periodicals to the Technology Department, interferes with the efficiency of their research. To correct this situation, a further reorganization of facilities in the Technology Department has enabled the library to increase the number of technical periodicals from 460 to more than 1,000.

The Technology Department periodicals are now located in the south end of the 14th floor reading room. It is hoped that the increased number of periodicals on the open shelves and the improvement in their arrangement will greatly facilitate the current research of engineers and others making use of the library's collections.

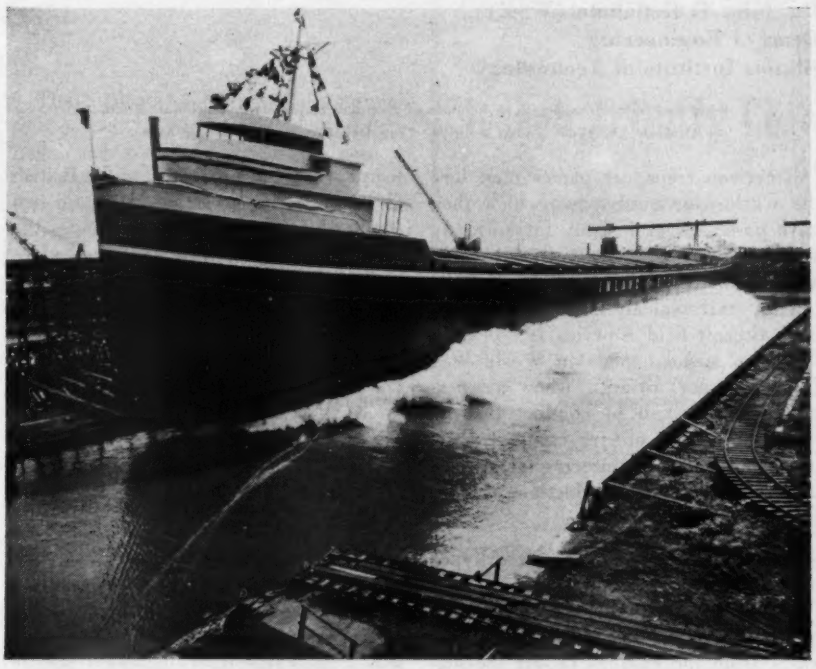
* * *

The registration program instituted on September 1 has disclosed that a much larger number of different readers make use of the library's facilities than was previously estimated. By November 15 the number of individuals registering for use of the library had reached 8,500. The registration records and the use of the collections by readers are being analyzed in considerable detail. The library will be able to ascertain from this analysis the extent to which its collections are used by engineers, as well as the various other special groups who do research in the library.

* * *

The Research Information Service was originally intended to be of assistance to industrial, engineering, and medical research workers in the Chicago area. The program has attracted very much wider interest as a result of news articles in *The Wall Street Journal, Chicago Journal of Commerce, Business Week, Iron Age, Power Generation,* and several other periodicals. More than 200 inquiries have been received from widely scattered cities, and work has been done for clients in eleven states, and in England, Italy, and Chili. A variety of engineering research problems have been included in the literature—search assignments.

Name Great Lakes Ship for Wilfred Sykes, Inland Steel President, WSE Trustee



The launching of the "Wilfred Sykes"

Wilfred B. Sykes, President of Inland Steel Company, and a WSE Trustee, has an unusual namesake, a ship built for his company, and shown above.

The biggest ore carrier on the Great Lakes, Inland Steel Company's "Wilfred Sykes," is shown being launched at the Lorain, Ohio yards of the American Shipbuilding Company. The "Sykes" is 20 per cent larger than any of Inland Steel's present ships, and 50 per cent larger than the average Great Lakes ore carrier. It has a cargo capacity of more than 20,000 gross tons.

A Westinghouse cross-compound turbine, driving the propeller shaft through a double reduction unit, gives the "Sykes" a speed of 16 miles per hour loaded, and 17½ miles per hour light.

The "Wilfred Sykes" will make round trips between Indiana Harbor and Superior, Wisconsin in five days; other ship in the fleet now take six and one-half days.

Jets For American Airliners

Dr. John T. Rettaliata (WSE)
Dean of Engineering
Illinois Institute of Technology

Presented before the American Institute of Electrical Engineers in Cincinnati, Ohio, on October 27, 1949, under the title, "The Decadence of American Airliners."

American transport planes may lose the world-wide supremacy which they have possessed exclusively for so many years. With its new types of gas turbine and jet airliners, Britain is winning its bid for universal air leadership. In the civil aircraft field America is repeating the same mistake made in World War II in military aircraft, when we permitted the British to conduct the development work on jet engines while our facilities and engineering talent were used for the mass production of conventional piston engines.

The British are working on two types of commercial transport planes. One type, the turbojet, has gas turbine engines where the high velocity exhaust gases from the engines propel the airplane by means of jet propulsion. This is the same method that is used in all of the latest high-speed military aircraft. The other type, the turboprop, has gas turbine engines whose principal function is to drive a propeller, with some residual energy in the exhaust gases also furnishing a jet-propulsion effect. Inherently a turbojet plane is faster than a turboprop type, because the efficiency of the propeller falls off at high speeds. Both turbojet and turboprop planes are capable of greater speeds than planes driven by piston engines with propellers. From a fuel consumption standpoint, however, the advantage is in the reverse order.

The de Havilland Comet is the most notable example of British efforts in the field of turbojet transports. The Comet is a four-engine, 36-passenger plane with a cruising speed of 500 miles per hour and a present range of 2000 miles at an altitude of 40,000 feet. After further modifications to improve range it is intended to fly from London to New York in six hours. This is approximately half the time now required with conventional transports. Flight tests on the Comet have revealed it to exceed its cruising speed and altitude specifications. Fourteen Comets are on order for the British Overseas Airways Corporation, and two for the Ministry of Supply. Besides the Comet the British have under development two other turbojet and four turboprop transports.

In addition to developing their own planes the British have also upgraded a Douglas DC-3 by installation of two gas turboprop engines in place of its two piston engines. The 3000 DC-3's now in operation will become obsolete when the new international regulations requiring ability to take off on only one engine are put into effect about 1951. The turboprops will meet this requirement and offer a means of salvaging these planes. Furthermore, the converted DC-3's would be capable of increased speeds and payloads up to ranges of approximately 350 miles.

Canada is also actively engaged in the construction of turbojet aircraft. The Avro XC-102 is the Canadian contribution to high speed airliners. This 50-passenger jet transport has a normal range of approximately 500 miles, cruising at 400 miles per hour at an altitude of 30,000 feet. Performance tests to date have demonstrated the exceptional characteristics of the plane. Rumors indicate contemplated purchases by American operators. There are many reasons why a turbojet transport is superior to the conventional piston engine type, for medium ranges up to approximately 1000 miles. Admittedly the fuel consumption of the jet is higher than that of the conventional engine, but the much greater speed capabilities of the former result in lower total operating costs per mile. This derives from the fact that fuel cost is only part of the picture. There are other costs, common to all types of airplanes, such as crew salaries, depreciation, insurance, maintenance, etc., which have a greater influence on total cost. This latter type of cost in dollars per hour does not vary greatly between jet and piston engine planes, with the result that the faster jet plane shows lower costs on a per mile basis.

Additional advantages accrue when it is considered that for a given volume of traffic fewer jet planes are required due to their greater speed, consequently reducing investment. Furthermore, because of the purely rotary motion of the turbojets compared with the reciprocation of piston engines, the jet airliner is virtually vibrationless, thus materially enhancing passenger comfort.

Its cabin noise level is also greatly reduced. In fact, it is reported that pilots in the XC-102 do not require earphones. Maintenance time on the turbojets should also be lower. The Air Force states that only five man-hours are required for a complete change of turbojet engines compared with 150 man-hours for piston engines.

The United Kingdom readily recognizes and accepts the superiority of the jet airliner over the conventional piston engine type. Such recognition is clearly evident by observation of the intense British development program now achieving fruition in this field. It is catastrophic that similar foresight is not prevalent in the United States. There is not a single turbojet or turboprop transport now under construction in this country. Even if such construction were started today, it would still be at least three years before commercial operation could be realized. Undoubtedly progressive airlines in this country will of necessity be purchasing foreign jet transports in the interest of continuing the policy of rendering to the public the best type of service available.

From a technical and production standpoint the United States is better qualified to develop turbojet transports than any other country. It may be unreasonable to expect, however, that private industry, even though convinced of the desirability, could undertake such a program without Federal assistance. With the exception of the de Havilland Comet, the British developments have been under Government subsidy. It would appear logical to employ some military appropriations for such a purpose, as transports are certainly used to a large degree in the normal conduct of wartime operations. If the United States is ever to regain its eminent position in the transport field positive action should be taken, and soon.

INSTITUTE OF DESIGN

To Affiliate with Illinois Institute of Technology

The Board of Trustees of the Institute of Design of Chicago and the Trustees of Illinois Institute of Technology have accepted a proposal that the Institute of Design become a degree-granting department of Illinois Institute of Technology.

This announcement was made by Walter P. Paepcke, Chairman of the Board, Container Corporation of America, and Chairman of the Institute of Design Board of Trustees, and Dr. Henry T. Heald, President of Illinois Tech.

This move brings to Illinois Tech a progressive department of design and will enable the Institute of Design to become an integral part of one of the nation's leading technological institutions of higher education, Dr. Heald and Mr. Paepcke said.

The Institute of Design will continue its curricula in industrial design and visual communications and teacher training in these fields.

Architectural students of the Institute of Design will be permitted to transfer to Illinois Tech's department of architecture, which will have the only course in architecture of the two institutions.

Serge Chermayeff, Director and President of the Institute of Design, will be Director of the department of design which will continue to be known for the present as the Institute of Design. Ludwig Mies van der Rohe, internationally known architect, will continue as Director of the Department of Architecture at Illinois Tech.

The Institute of Design will continue to operate in its present quarters at 632 North Dearborn Street (the former Chicago Historical Society building) for the present. Later it will be moved to Illinois Tech's modern new campus on Chicago's south side, according to present plans.

Dr. Heald and Mr. Paepcke said that members of the Board of Directors of the Institute of Design will be invited to serve as an advisory committee for the new Illinois Tech program.

The Institute of Design, founded in October 1937, has been known as the "New Bauhaus" and later as the School of Design. Lazlo Moholy Nagy, author of "The New Vision" and "Vision in Motion," was Founder and Director until his death in 1946. Mr. Chermayeff, formerly Professor of Architecture and Chairman of the Department of Design at Brooklyn College, has been director since 1946. Four hundred full and part-time students are now enrolled for day classes and more than five hundred in evening courses.

Illinois Institute of Technology was formed in 1940 through the consolidation of Armour Institute of Technology and Lewis Institute, two half-century-old Chicago institutions. Illinois Tech has since expanded its engineering and technological educational and research program and completed a portion of its new 110-acre campus in the vicinity of 33rd and State streets.

Plan Engineering Examinations, Refresher Courses In Early 1950

The examination for registration as a professional engineer, given twice each year by the Department of Registration and Education, was held in Chicago, December 8 and 9. The next one will be given in May, 1950.

Application for the examination should be made to the Department of Registration and Information, Springfield, Illinois.

Refresher courses, sponsored by WSE, the four Founder Societies, and the Illinois Society of Professional Engineers, will also be given twice yearly, and registration should be made with T. N. Dekker, University of Illinois Extension Division, LaSalle Hotel. The course meets for a ten-week period, twice a week for two hours, and will be held again during Spring, 1950, preceding the next professional engineer examination. The tuition is about $15.

Copies of questions used in previous examinations are available from several sources. Questions used in May and in November, 1948, published in cooperation with the Illinois Society of Professional Engineers, may be obtained from R. K. Knewton, University of Illinois Extension Division, 205 Arcade Building, Champaign, Illinois. The cost is $1.00. Copies of the exam questions used in November, 1946, are available from WSE headquarters, at a cost of $.75 to members and $1.00 to nonmembers.

Arrange Structural Course

The Western Society of Engineers and the Illinois Section of the American Society of Civil Engineers announce that plans are completed with the University of Illinois, Division of University Extension to hold a refresher course in Structural Engineering beginning January 5, at Navy Pier in Room 65 at 6:30 p.m. Classes will be held thereafter every Tuesday and Thursday from 7 to 9 p.m. through March 14, 1950.

The course will be taught by faculty members of the University of Illinois' college of engineering in cooperation with the Illinois Institute of Technology and Northwestern Technological Institute. Tuition fee: $16.50, payable the first night of class. Make checks payable to the University of Illinois.

Give Courses in N. Y.

Evening "brush-up" courses for engineers in New York and New Jersey started in September. Seven courses are being offered, with weekly and bi-weekly sessions covering from 10 to 16 weeks.

They are being sponsored by The American Society of Mechanical Engineers, New York Metropolitan Section, and the American Institute of Electrical Engineers, N. Y. Section, Power and Industrial Division.

The curriculum is planned for engineers who desire refresher or supplemental training, and those preparing for professional engineer license examinations in New York or New Jersey. Classes are taught by specialists in the fields covered.

Among the courses being offered are structural planning and design, basic engineering sciences, economics of power supply and operations, effective speaking, advanced effective speaking, introduction to servo-mechanisms in industry, electrical construction methods.

WSE Women's Council News

Wednesday, December 14th, the Professional Women's Council of Western Society of Engineers will have as their guest speaker, Dr. Martha A. Ziegler, who, since May 1949, has been Superintendent of Women's and Children's Employment of the State of Illinois' Labor Department. Dr. Ziegler will speak on legislation, now in effect and pending, which will affect the employment and working status of professional women. The meeting will be called to order at 7:30 p.m. Miss Mary Murphy, Chairman, will preside. Miss Georgiana Peeney is in charge of the program.

Dr. Ziegler is from Evanston. She received her B.A. and M.A. from the University of Illinois and her Ph.D. from Northwestern University. She taught political science at Northwestern for 10 years and was field representative of the U.S. Dept. of Labor Women's Bureau.

* * *

ATTENTION, MEMBERS of W.S.E.! You would do well to attend this meeting. You probably wonder what goes on at one of the Professional Women's Council meetings, and this is a good time to find out and, incidentally, get information valuable to you in your dealings with your fellow workers and employees. You are always welcome! There will be a pre-meeting get-together for dinner at 5:30 p.m. in the dining room.

* * *

ATTENTION, MEMBERS of WOMEN'S COUNCIL! This will be a fine time to bring that member-prospect. Christmas may be only a few days off but spring isn't far either and we want to make it a regular Professional Women's DIVISION by spring!

* * *

Miss Clara Lawrence of the Women's Council has been elected to the American Ordnance Association. Congratulations!

* * *

MERRY CHRISTMAS FROM THE PROFESSIONAL WOMEN'S COUNCIL TO ALL OF YOU!

Two Armour Men Tour Latin Countries To Discuss Research Needs, Potentialities

Two American industrial research leaders toured nine Latin American countries from October 22 to November 22 to stimulate interest in scientific research for the technological and industrial advancement of South American industries.

Dr. Haldon A. Leedy, director of Armour Research Foundation of Illinois Institute of Technology and Dr. Francis W. Godwin, director of the Foundation's International Division, discussed research with Latin American financial, industrial, and governmental officials in South America.

For the past five years the Foundation has maintained and operated industrial research facilities in Mexico City as part of its Armour Plan for International Technical Assistance.

"This research plan has demonstrated its effectiveness by contributing to the technological needs of the nation at a relatively small cost, assisting in training Mexican technological personnel, and helping Mexico to put its research on a self-sustaining basis," Dr. Godwin said.

"The Foundation has been so gratified with the success of the plan in Mexico that it believes it is now time to make it available to other Latin American countries."

While the largest research programs of the International Division have been conducted in Mexico, they have not been limited to that country. Many projects have been successfully completed for other Latin American nations.

The desire for technological research in these countries has led officials to urge the extension of the Armour Plan for International Technical Assistance throughout Latin America.

Dr. Leedy and Dr. Godwin discussed the possibilities of such a coordinated effort during their tour. Extension of the Foundation's research program in South America will be a direct application of President Truman's "Point Four" program on the need for export of technological know-how to nations less industrially developed than the United States.

The Foundation representatives also explored the possibilities of establishing fellowships for qualified advanced Latin American students to work and learn in the Chicago laboratories of the Foundation.

"Throughout its existence, the International Division has aided in the economic development of other countries only at the specific request of the nations themselves or their individual private industrialists," Dr. Leedy said.

"In broadening the Foundation's service to a world-wide basis, the Foundation is guided by the recognized desirability of stimulating international trade and helping improve living conditions for people all over the world."

During the four-week trip, the men made stops at San Juan, Puerto Rico; Rio de Janeiro, Brazil; Sao Paulo, Brazil; Montevideo, Uruguay; Santiago, Chili; Lima, Peru; Cali, Colombia; Bogota, Colombia; Caracas, Venezuela, and Ciudad Trujillo, Dominican Republic.

Income of Metallurgists Tops Engineering Groups, According to New National Survey

Metallurgy is the highest paid of the engineering professions.

This fact was established as a result of a recent national survey conducted by the American Society for Metals from its National headquarters in Cleveland, Ohio.

The survey, first of its kind ever made, also classified the professional metallurgist as to his title, class of work, responsibility over others, distribution of time, products made by his company, as well as salary bracket at different periods of employment.

This occupational analysis of the metallurgical profession, conducted by the metalworking industry's basic society, establishes for the first time a separately defined status for the metallurgist. Previous statistics on this important member of the engineering profession have been in conjunction with mining engineers or other groups.

The average income for metallurgists, according to the ASM analysis, is $6,567. The National average income for all types of engineering, according to the U. S. Bureau of Labor Statistics, is $4,668. Comparisons with other professional incomes are equally impressive. The lawyer receives an average of $5,719; the chemical engineer's annual average is $4,320. The average yearly income of all college graduates in the U. S. is $4,689, while the average yearly pay of all U. S. workers is $2,840.

Three factors were shown to affect a metallurgist's income: his responsibility, his college or technical training, and the length of time on the job.

Aside from 6.5% of those queried who had succeeded to administrative and sales positions, the responsibility of metallurgical control over quality and production offered the highest income—a high of $35,000, with an average of $7,221.

The second factor—that of technical training—shows that with a bachelor degree, the metallurgist's income averaged $6,601. A master's degree justified $6,877. The metallurgist with a doctor's degree has an average yearly income of $9,122.

The third influence came from experience or length of service. Metallurgists with one year out of college drew an average income of $3,700. After five years on the job, the average went to $5,500. Ten years experience advanced the income to an average of around $6,500. Twenty years after graduation, the metallurgist was averaging $8,100. The peak average income is reached thirty years after receiving a college degree—$9,000.

Cleaner Air for Chicago

(*Continued from Page 6*)

records of success. These committees would assume responsibility for development of the program of research for evaluation of causes and effects, and of the method for overcoming air pollution as it affects their respective fields. I learned today that already such committees are at work.

The Board of Direction would implement and coordinate the activities of these committees through a Director of the Plan for Cleaner Air. They would keep industry and the public fully in touch with the program and its progress. They also would work closely with the law enforcement agencies, with the Smoke Abatement Department, the Smoke Prevention Association, and with other technical agencies. Likewise by establishing liaison with similar agencies in other large centers such as Pittsburgh and Los Angeles, they would save much duplication of effort.

In this connection it is important to realize that this joint effort between the City of Chicago and its *industry* will be costly. The cost of some of the work is the responsibility of the city; some of industry. Both should share in the expense. To keep it at a minimum and to insure an economically sound program requires direction of the highest caliber.

There are many paths to clean air. The one to take first lies through an understanding of the problem and the selection of a plan of execution ably directed. When this is done, the end of the road will be practically in sight.

Hails Engineering Careers For Women

Dr. Lillian M. Gilbreth, 71, world-famous woman engineer, psychologist and mother of twelve, believes there is a great future for women in the engineering field.

Addressing 600 members of the Chicago section of the A.S.M.E. November 22, she said:

"Theoretically, there isn't any job a woman can't do, particularly today when she has the opportunity to learn anything."

December Advertisers

Elect ESPS Officers

Officers of the Engineering Societies Personnel Service for 1949-50 were elected at a recent meeting of the organization's Chicago Advisory Committee.

Dean Ovid W. Eshbach, Northwestern Technological Institute, is Chairman, and represents the A.I.E.E.

Other officers are: Vice Chairman, John F. Seifried, District Manager, Ceco Steel Products Company, representing the A.S.C.E.; Treasurer, Rudolph Tietig, Jr., Engineer, A. J. Boynton & Co., representing the A.I.M.E.; Secretary, Joseph R. Decker, Manager, Engineering Societies Personnel Service, Inc.

J. N. Stanbery, Vice President of Illinois Bell Telephone Company, representing WSE, and C. C. Austin, General Manager, Mancha Division, Goodman Manufacturing Company, representing the A.S.M.E. will continue as members of the Advisory Committee.

J. C. Witt, WSE, Patents Clinkerer

The Counter-Cyclone Clinkerer is a clinker-producing unit designed and recently patented by J. C. Witt, WSE's Second Vice President.

Observations, calculations, and studies have extended over a ten-year period. During the past two years, some phases of the development, under the direction of Mr. Witt, have been financed by Marquette Cement Manufacturing Company at the experimental engineering laboratories of a well known research organization. Other individuals and organizations have assisted in the work from time to time.

Starting with preliminary laboratory experiments, the development has progressed through three pilot plants, increasing in size and capacity. The construction of a semi-commercial scale plant is now justified.

The indications are that the Clinkerer in comparison with the present-day rotary kiln has a number of advantages, of which the following may be mentioned:

Lower capitalization, lower over-all fuel requirements, lower cost of refractories maintenance, greater flexibility of operation, greater uniformity of product, less power for grinding clinker.

The most startling phase of Clinkerer operation to make its appearance so far is that clinker passing A.S.T.M. specifications has been produced in 20-30 seconds—in contrast to the hours required in rotary kilns.

The original design is described in patent number 2489211, dated November 22, 1949. Some modifications in design are disclosed in an application for a second patent now on file. Various types of the Clinkerer may be developed without departure from the basic principles, and it is expected that other applications will be filed.

Graver Opens New Branch Offices

Graver Water Conditioning Co., manufacturers of equipment for all water treatment and liquid conditioning processes, announces the establishment of new sales and field engineering offices in Cleveland, in the Hippodrome Building, and in Philadelphia. in the Commercial Trust Building. The Cleveland office is in charge of Herman Ross, (WSE), formerly assistant manager of the Chicago District Office, and the Philadelphia office is headed by Robert Schenker, who has recently joined the company.

The general offices of the company are at 216 West 14th Street, New York 11, N. Y., where the administrative, sales, technical and engineering departments are located.

In addition to these offices, the Company also maintains a district office in Chicago at 332 S. Michigan Ave., in charge of Harold Fosnot (WSE). This office is also the headquarters of Emmett Cordes, in charge of field service.

Graver Water Conditioning Co., manufactures hot process and zeolite water softeners, demineralizers, deaerators, clarifiers, filters and chemical feeders for all process waters and other liquids.

Awards Open to WSE Members

Younger members of WSE are eligible to compete for two awards honoring engineers, both of them granted for excellence of papers submitted. The subject is not restricted, so engineers of all fields should be interested in competing.

Members who have not passed their 31st birthday are eligible to be considered for the Alfred Noble award, established in 1929 to honor the late Alfred Noble, Past-President of WSE and of the ASCE.

The award is made to any member of WSE and the four Founder Societies, for a technical paper of exceptional merit accepted by the Publication Committee of any of the five sponsoring societies for publication in one of its technical publications.

Each paper forwarded to the Joint Prize Committee must contain a brief synopsis; a statement of the paper's purposes, and a concise statement of its conclusions—unless this information appears in the paper itself. Papers by joint authors are not acceptable.

The amount of the prize, which is a cash award, and the contribution, if any, for payment of transportation expenses to and from the meeting at which the prize is awarded, are set by the Board of Direction of the ASCE, which administers the fund. The prize is accompanied by a certificate of award.

The recipient of the prize is selected by a committee of five, one from each of the participating societies, and the award is based on papers published by each society during the year ending June 1. The papers must be submitted to the Joint Committee by the society, not later than August 15, and must be presented in full even if published in abstract.

The award is made publicly by an ASCE representative at a general meeting of the society of which the recipient is a member.

Charles Ellet Award

Members of the Junior Division are eligible to compete for the annual Charles Ellet Award for the best semi-technical paper presented before WSE members.

Contestants will be judged both on the written paper and on the oral delivery, and the winner will be formally presented with the Charles Ellet Award at the annual WSE dinner meeting on May 29, 1950.

Established in 1929 by a gift from E. C. Schuman, a Junior member, the award is symbolized by a silver loving cup with each recipient's name and alma mater engraved thereon. This is displayed in the WSE headquarters. In addition to this honor, the winner receives $25.00 and an engraved Certificate of Award.

The paper should present a lay-treatment of a semi-technical subject. Objective but complete coverage, rather than complex formulæ and derivations, is desired.

There is no restriction or limitation on the choice of subject for this paper. Judging, however, will be performed by a 5-man award committee giving equal weight to each of the following five (5) points:

(1) Timeliness of the subject.
(2) Engineering application of the subject.
(3) Knowledge of the subject.
(4) Preparation of the paper.
(5) Presentation of the paper.

The paper should be typewritten, double spaced, less than 2,000 words and submitted in triplicate. Although submitted in writing, the paper must be presented orally, and not read verbatim, at the competitive meeting. Charts, diagrams or other visual aids which assist in the presentation of the subject should, of course, be used wherever necessary and should be incorporated in both the manuscript and the oral presentation.

All Junior members (28 years of age and under) are urged to file notice with the secretary's office and prepare a paper for this competition.

Further inquiries concerning the Alfred Noble Award or the Charles Ellet Award should be sent to WSE Headquarters.

Honored Before Death

Dr. Frank B. Jewett, former President of the National Academy of Sciences, who died November 11, had been designated to receive the Hoover Medal for 1949, one of the highest honors of the engineering profession, according to Scott Turner, Chairman of the Board of Awards. He was an outstanding figure in the scientific and engineering world.

For many years Dr. Jewett was Vice President of the American Telephone and Telegraph Company, and President of the Bell Telephone Laboratories. He was a former President of the American Institute of Electrical Engineers.

The medal is awarded by the four Founder Societies, and was to be conferred on Dr. Jewett at the Winter General Meeting of the A.I.E.E., in January.

The medal, first awarded Herbert Hoover in 1930 and named for him, is given "by engineers to a fellow engineer for distinguished public service."

Three representatives of each of the four societies constitute the Board of Award and administer the medal fund, the gift of the late Conrad N. Lauer, a Past President of the American Society of Mechanical Engineers.

WSE Applications

In accordance with the By-laws of the Western Society of Engineers, the following names of applicants are being submitted to the Admissions committee for examination as to their qualifications for admission to membership into the Society in the various grades, i.e., Student, Junior, Member, Associate, etc. All applicants must meet the highest standards of character and professionalism in order to qualify for admission, and each member of the Society should be alert to his responsibility to assist the Admissions committee in establishing that these standards are met. Any member of the Society, therefore, who has information relative to the qualifications or fitness of any of the applicants listed below, should inform the Secretary's office, 84 E. Randolph St., RA ndolph 6—1736.

148-81 John S. Roscoe, District Manager, Lincoln Electric Co., Cleveland, Ohio.

149-81 Donald F. Leal, 1805 S. 17th Ave., Maywood, attending Illinois Institute of Technology.

150-81 Leno A. Marconi, President, L. A. Marconi Co., 767 Milwaukee Ave.

151-81 Robert W. Richter, 3556 W. 65th Pl., attending Illinois Institute of Technology.

152-81 Frank W. Johnson, President, Johnson Bros. Heating Co., 1419 Belle Plaine Ave.

153-81 Roy S. Kerns, Special Representative, The Oxweld Railroad Service Co., 230 N. Michigan Ave.

154-81 Robert A. Vandervest, 5047 W. Altgeld St., attending Illinois Institute of Technology.

155-81 L. J. Carson, Chief Engineer, Link-Belt Co. (Caldwell Plant), 2410 W. 18th St.

156-81 Thomas M. Harris, District Engineer, Link-Belt Co., 301 W. Pershing Rd.

157-81 Edward H. Kyvig, Engineer—Wage Practices Div., Western Electric Co., Hawthorne Station.

158-81 Edward W. Schmidt, Development Engineer, Link-Belt Co., 2410 W. 18th St.

159-81 John J. Scott, 2249 E. 75th St., attending Illinois Institute of Technology.

160-81 George E. Lane, 11255 South Park Av., attending Illinois Institute of Technology.

161-81 Thomas K. Murphy, Plant Engineer, Illinois Bell Telephone Co., 131 N. Franklin St.

162-81 Carl D. Dimity, Transmission-Distribution Engineer, Phelps Dodge Copper Prod. Corp., 100 W. Monroe St.

163-81 Clarence W. Price, Fire Protection Engineer, Marsh & McLennan, 231 S. LaSalle St.

164-81 Jens C. Holm, Director of Engrg., Marquette Cement Mfg. Co., 20 N. Wacker Dr.

165-81 J. V. Schuster, Supervising Engineer, Commonwealth Edison Co., 2233 S. Throop St.

166-81 W. Marshall O'Neil, Engineer, Teletype Corp., 1400 Wrightwood Av.

167-81 Robert C. Emmett, District Manager, Pittsburgh Testing Laboratory, 411 N. LaSalle St.

168-81 Gerald E. Ragan, 8816 S. Bishop St., attending Illinois Institute of Technology.

169-81 Howard J. Snitoff, Structural Engineer, 159 E. Chicago Ave.

170-81 Raymond Epstein, Vice President, A. Epstein and Sons, Inc., 2011 W. Pershing Rd.

171-81 Joseph F. Calek, Jr., 6241 W. Roosevelt Rd., Berwyn, Ill., attending Illinois Institute of Technology.

172-81 Edward C. Rubin, 5902 W. 26th St., Cicero, attending Illinois Institute of Technology.

173-81 Albert C. Suhajda, 826 N. Homan Ave., attending Illinois Institute of Technology.

174-81 Lawrence C. Von Moll, Apprentice Engineer, Link-Belt Co., 2410 W. 18th St.

175-81 Harold A. Bergen, 3743 W. Windsor Ave., attending Illinois Institute of Technology.

176-81 Leslie O. Knight, Engineer, Illinois Bell Telephone Co., 212 W. Washington St.

177-81 Ingebrigt Lunos, Designer, Ralph H. Burke, 20 N. Wacker Dr.

178-81 John Slezak (Rein), President, The Turner Brass Works, Sycamore, Ill.

179-81 Frank V. Svelnis, Jr., 502 W. 81st St., attending Illinois Institute of Technology.

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WSE Applications

(*Continued from Page* 27)

180-81 Frederick J. Mehl, Equipment Engineer (Telephone), Western Electric Co., Hawthorne Station.

181-81 Harold I. Southerwick, Elect. Engr. (Checker), Ralph H. Burke, Wolf Rd. & Bryn Mawr Ave., Bensenville, Ill.

182-81 Donald F. Rietz, 4823 W. Gunnison St., attending Illinois Institute of Technology.

183-81 Lester D. White, Holabird & Root & Burgee, 180 N. Wabash Ave.

184-81 Isadore Goldberg, President, Goldberg & O'Brien Electric Co., 17 S. Jefferson St.

185-81 George A. Koe (Trsf.), Mechanical Engineer, Continental Can Co., 7600 S. Racine Ave.

186-81 Morton E. Goldberg, 6833 Merrill Ave., attending Illinois Institute of Technology.

187-81 Charles E. Angermayer, 4445 N. Lavergne Av., attending Illinois Institute of Technology.

188-81 C. J. Dellutri, 2840 S. Wallace St., attending Illinois Institute of Technology.

189-81 T. L. Hankins, President & General Manager, Condo Electric Co., 1071 W. Fry St.

190-81 Richard E. Wilkinson, Detailer & Estimator, American Bridge Co., 208 S. LaSalle St.

191-81 James T. Barlow, 7723 Evans Ave., attending Illinois Institute of Technology.

192-81 George L. Carlson, Project Manager, Ragnar Benson, Inc., 4744 W. Rice St.

193-81 Joseph H. Flanagan, Merchandise Manager (& Sales Promotion), Standard Oil Company (Ind.), 910 S. Michigan Ave.

194-81 William A. Kesl, 2646 S. 61st Ct., Cicero, attending Illinois Institute of Technology.

195-81 James W. Mullins, Plant Engineer, Illinois Bell Telephone Co., 212 W. Washington St.

196-81 George P. Stacy, 1336 S. Lombard Ave., Berwyn, Ill., attending Illinois Institute of Technology.

197-81 Jack H. Kaleher, Engineering Draftsman, Link-Belt Corp., 300 W. Pershing Rd.

198-81 James T. Noble, District Plant Engineer, Illinois Bell Telephone Co., 725 Chicago St., Hammond, Ind.

199-81 Eugene J. Stankiewicz, Chief Structural Engineer, Sargent and Lundy, 140 S. Dearborn St.

200-81 Kenneth S. Van Epps, Staff Engineer, Public Service Company of Northern Illinois, 72 W. Adams St.

201-81 Max Zar, Chief Structural Draftsman, Sargent & Lundy, 140 S. Dearborn St.

202-81 Duncan M. Campbell, Chief Engineer, Cook County Highway Dept., 160 N. LaSalle St.

203-81 David W. Harris, President & Director, Universal Oil Products Co., 310 S. Michigan Ave.

204-81 Anton J. Pros, Jr., 2609 S. Lombard Av., Cicero, attending Illinois Institute of Technology.

205-81 Lucille B. Chawk, Engineer, Illinois Bell Telephone Co., 208 W. Washington St.

206-81 Robert A. Rivens, 157 N. Euclid Ave., Oak Park, Ill., attending Northwestern University.

207-81 Robert H. Crego, Plant Engineer, Michael Reese Hospital, 29th St. & Ellis Ave.

208-81 Bruno P. Glab, 6120 S. Keeler Ave., attending Illinois Institute of Technology.

209-81 Philip J. Larson, Contracting Manager, American Bridge Co., 208 S. LaSalle St.

210-81 Paul A. Link, 2409 - 60th Ct., Cicero, attending Illinois Institute of Technology.

211-81 Lawrence Margol (Trsf.), Junior Engineer, Zuce Kogan & Associates, Inc., 724 Sheridan Rd.

212-81 John J. McAuliffe, Industrial Engineer, Hanna Engineering Co., 1765 Elston Ave.

213-81 Henry M. Mlynski, Chief Time Study Engineer, Hanna Engineering Co., 1765 Elston Ave.

214-81 John A. Romano, Assistant Sales Manager, Delta-Star Electric Co., 2437 W. Fulton St.

215-81 David B. Klapper, Assistant Engineer, Public Service Company of Northern Illinois, 72 W. Adams St.

216-81 Fred W. Kramer, President, Fred C. Kramer Co., 128 S. Paulina St.

217-81 Allen S. Pearl, Secretary-Treasurer, Delta-Star Electric Co., 2400 Fulton St.

218-81 Raymond J. Flood, Civil Engineer, Contracting and Material Co., 1235 Dodge Ave., Evanston, Ill.

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221-81 Dale K. Auck, Fire Prevention Engineer, Federation of Mutual Fire Insurance Co., 919 N. Michigan Av.

222-81 Carroll W. Hanna, District Manager, Gould Storage Battery Corp., 175 W. Jackson Blvd.

223-81 William C. Barrows, 3140 S. Michigan Ave., attending Illinois Institute of Technology.

Reviews of Technical Books

Electronics Index

The Electronic Engineering Master Index, ed. by Frank A. Petraglia, The MacMillan Co., New York, 1946. 209 pp. Price $6.00.

The field of electronics overlaps so many of the various engineering branches that literature on the subject appears in a wide variety of publications. An index of this type serves a great need in this time of wider application of electronics.

This index covers the period from 1935 to 1945 and contains approximately 10,000 entries taken from 65 engineering periodicals. It is well arranged and cross-indexed for quick and convenient use.

J. A. S., WSE.

Laminates

Engineering Laminates, by Albert G. H. Dietz, John Wiley & Sons, Inc., New York, 1949. 797 pp. $10.00.

Each of the twenty-four chapters of this book was prepared by an expert in the field, representing industrial corporations in positions such as chief engineer, director of research or metallurgist. Dr. Dietz has compiled and edited the material into an encyclopedia covering a broad range of engineering laminates. Such materials are employed in increasing volume because they combine the properties of their component parts to obtain advantages in economy, strength, hardness, resistance to wear, breakage or corrosion, or in other unique and desirable characteristics.

Many lamination processes and materials are described. Discussions pertain to physical, metallurgical and chemical properties, manufacture, commercial applications, merits of competing materials, corrosion, together with mathematical developments and illustrations.

E. B., WSE.

Heat Engines

Theory and Practice of Heat Engines, by Virgil Moring Faires, The MacMillan Company, New York, 1948. 388 pp. $5.00.

The author prepared this book to serve as a college text, the subject being covered in a broad but easily comprehended manner. It will also be of value for review, for reference, and in preparation for license examinations. There is an excellent balance between description and illustration of commercial equipment and that portion of thermodynamics specifically dealing with heat engines, including necessary equations, problems and answers.

General subjects treated include compressors, internal combustion engines, steam turbines, nozzles, steam engines and generators (boilers), steam power plant equipment, fuels and combustion, and refrigeration. Six chapters are devoted to theoretical laws and calculations commonly encountered in engineering pertaining to such apparatus.

E. B., WSE.

Oil Production

Petroleum Production, Vol. IV, Condensate Production and Cycling, by Park J. Jones. Reinhold Publishing Corporation, New York, 1948. 238 pp. $5.00.

In line with the earlier volumes of this series, the present volume is a well organized analysis of the technical and economic factors involved in petroleum condensate production and cycling the gas back to the well. It will be valuable to anyone engaged in this phase of petroleum production, as the author shows an extensive and intimate knowledge of practical problems and solutions.

The treatment of oil reservoir conditions and production factors is mathematical, and graphs are used profusely in the portrayal of typical situations. The volume is divided into Part I: Foundations, and Part II: Applications. This book maintains the high quality of the previous volumes. It is an excellent edition to a production engineer's library.

Gustav Egloff, WSE.

Highway Problems

Introduction to Highway Engineering, Fifth Ed. by John H. Bateman, John Wiley & Sons, Inc., New York, 1948. 538 pp. Price $5.50.

Typical of most highway textbooks, this book deals with principles pertaining to the design of rural highways. A limited space is devoted to expressways although a chapter on general design features and one on soils give data applicable to all types. Much emphasis is placed on materials for rigid and flexible pavements and design.

The text is well illustrated with tables, charts and photographs and each chapter has a bibliography of selected references. Planning, financing and administration are covered briefly and the book concludes with problems designed for the use of students.

G. L. J., WSE.

Radiant Heating

Radiant Heating—Second Ed. by T. Napier Adiam, The Industrial Press, New York, 1949. 504 pp., $6.00.

This is a revised and enlarged edition of an excellent book which was first published in 1947, when we originally reviewed the book.

It covers design, installation and control of hot water, steam, warm air and electric radiant heating for buildings. Other subjects treated are radiant cooling and snow melting and also panel and infrared heating. The author is a consulting engineer and an executive of a major heating equipment manufacturer and is well qualified by experience both in this country and abroad to illustrate these comparatively new practices.

Architects, engineers and contractors will find this book practical, broad in scope, and dependable.

E. B., WSE.

(*Continued on Page* 30)

Minerals

Strategic Minerals, by John B. DeMille, McGraw-Hill Book Company, Inc., New York-London, 1947. 626 pp. $7.50.

This comprehensive treatise presents in alphabetical order seventy-six strategic metals and minerals, devoting in effect a chapter to each. The author is a well known consulting geologist and writer who served during the war years as senior engineer in the mining section of the R.F.C.

The work includes all metals of major importance and many others of smaller consumption but equally indispensable, together with those minerals vital to war needs and industry. The discussions include properties, uses, domestic sources of supply and production, world production, imports and exports and prices.

The book should prove of value to the business executive, geologist, metallurgist, engineer and to those responsible for conserving our natural resources.

E. B., WSE.

Weld Design

Weld Design, by Harry D. Churchill and John B. Austin, published by Prentice-Hall, Inc., New York, 1949. 216 pp. $6.65.

This book was recommended for publication by the jury of award in the textbook award program of the James F. Lincoln Arc Welding Foundation. Mr. Churchill is professor of engineering mechanics, Case Institute of Technology, and Mr. Austin is a welding engineer, Republic Structural Iron Works.

In recent years electric arc welding has developed to a point, both metallurgically and in a manufacturing sense, where it has been generally recognized by the machine tool designer. It is the purpose of this book to supply dependable information, covering theoretical design and practical experience, required in the production of the structural machine bases and supporting members which are gradually replacing castings formerly used.

E. B., WSE.

Pump Design

Centrifugal and Axial Flow Pumps, by A. J. Stepanoff, John Wiley & Sons, Inc., New York, 1948. 428 pp. $7.50.

Dr. Stepanoff, a development engineer for the Ingersoll-Rand Co., and Melville Medalist, 1932, ASME, is recognized as an expert in the design of pumping machinery. This book is an exhaustive presentation of the theory, design, and application of centrifugal, mixed flow and axial flow pumps, the progress of which has been so rapid that almost all limitations of pressure, capacity, temperature, nature of liquid, and speed of operation have disappeared. A new and simple treatment of the impeller is presented and questions of general interest such as cavitation thoroughly discussed.

The book is intended for the builder and designer of pumps but it will also be of interest to those who are in responsible positions encountered in the specification, purchase and operation of such equipment.

E. B., WSE.

Metal Processing

Metal Process Engineering, by Norman E. Woldman, Reinhold Publishing Corp., New York, 1948. 291 pp.

Devoted to the presentation of modern metal processing, this book particularly stresses the handicaps and relative merits of commonly employed and recent practices with respect to specific types of finished products. Chapters pertain to casting, the mechanical working of metals and alloys, forging, powder metallurgy, joining of metals, castings versus forgings versus welds, heat treatment, surface hardening of metals, and tool steels.

The work will be of value to the advanced student, metallurgist, engineer, designer and production executive in obtaining a better understanding of metals from the raw state to the finished output. The author devotes considerable space to recent developments such as the art of converting metal powders into useful solid products and to many miscellaneous practices such as soldering, brazing and the various types of welds.

E. B., WSE.

Brewing Practices

The Practical Brewer, by Edward H. Vogel, Jr., Frank H. Schwaiger, Henry G. Leonhardt and J. Adolph Merten, Master Brewers' Association of America, 1946. 332 pp.

This is an official publication by the production and technical organization of the brewing industry and has been sponsored by the United States Brewers' Foundation. In addition to the co-authors who are production executives, it was edited by an editorial board of 21 experts in brewing, grain and machinery.

While the book is intended for use as an operating manual, it will be of particular value to the engineer or others specializing in the industry or its various phases, who will appreciate the wide range of equipment and processes illustrated and explained.

E. B., WSE.

Geometry and Calculus

Analytic Geometry and Calculus, by John F. Randolph and Mark Kac. The MacMillan Co., New York, 1946. 642 pp. $4.75.

As stated by the authors, "In this book the subjects of analytic geometry and calculus are treated together in such a way that each complements the other. This manner of treatment enables the student taking physics, chemistry, or engineering, concurrently with mathematics based on this textbook, to gain concepts of calculus early enough to be helpful to him in these subjects."

Numerous examples of the use of differential and integral calculus in the solution of problems in engineering and the sciences are given. A table of integrals and answers to problems is given at the back of the book.

This is a good textbook for college students, and also for engineers who wish to have an up-to-date reference book on the subjects covered.

H. F. W., WSE.

Radio History

Commercial Broadcasting Pioneer, by W. P. Banning, Harvard University Press, 1946. 308 pp. $3.50.

This is an historical narrative of the Bell Telephone Company's part in the early days of radio broadcasting. Beginning with the launching of station WEAF in 1922, Mr. Banning traces the development of network broadcasting, to the retirement of the Bell System from the entertainment phases of the business with the sale of WEAF in 1926. Originally compiled as an institutional document for private use within the Bell companies, this book was later published by the Business Historical Society. It lists and credits practically every Bell engineer who was associated with the early days of broadcasting.

One cannot avoid the temptation to compare it with Gleason L. Archer's "History of Radio to 1926." Together, these two works present rather a complete history of the emergence of broadcasting as a big business, with Mr. Banning's book relating the Bell System's side of the story while Mr. Archer's covers the same period, but mainly from the viewpoint of the so-called "radio" group, composed of General Electric, Westinghouse and RCA.

W.F.L., MWSE.

Thermodynamics

Thermodynamics, by Lester C. Lichty, McGraw-Hill Book Co. Inc., New York, 1948. 341 pp. $4.50.

This is the second edition of the college textbook first printed in 1936. It is an unusually simple development of fundamental relations and equations, grouped from the standpoint of thermodynamic analysis, rather than mechanical equipment.

Chapters are devoted to energy terms and equations, properties and mixtures of mediums, thermodynamic processes and cycles, availability of energy, the combustion process, internal combustion engine and gas turbine processes, and the flow of fluids.

A generous number of problems is given at the end of each chapter. The appendix is an additional chapter on thermodynamic relations and properties of mediums, with tables and charts.

H.F.W., MWSE.

Engineering Law

The Specifications and Law on Engineering Works, by Walter C. Sadler, John Wiley & Sons, Inc., New York, and Chapman & Hall, LTD., London, 1948. 493 pp. $5.00.

The author is qualified with degrees and experience in both engineering and law and in teaching engineering law.

Of particular value is the presentation of procedures, specifications and matters associated with major contracts from advertisement for bids to completion and acceptance of the projects. The steps to be taken in preparing such agreements are discussed both with respect to engineering and law and are further illustrated with liberal extracts from the contract documents of important public and private works.

Considerable space is devoted to sales, agencies, leasing of equipment, oral and written agreements and a wide range of other business activities, with careful explanation of the legal aspects of such transactions. The origin of our laws is set forth together with an outline of machinery available for enactment and enforcement of laws. To illustrate such matters many law suits pertaining to business agreements are discussed. Frequently decisions rendered are based upon what may appear to be incidental items but nevertheless in accordance with long established practices.

On projects of major importance and cost warranting careful preparation of documents in accordance with standard procedures, misunderstandings are generally of minor scope or due to unforeseen events. There is, however, a tendency on the part of architects, engineers and others, to greatly shorten specifications and contracts so as to substitute terseness for simple but complete statements. In the appendix of this book are extracts illustrating the more elaborate treatment and the shortened form of contract.

This book presents many pertinent facts and an excellent explanation of engineering and legal elements entering into contract agreements; it should be of interest and value to all concerned with such work.

E.B., MWSE.

Building Design

Design of Steel Buildings, by H. D. Hauf and H. A. Pfisterer. 3rd Edition, John Wiley and Sons Inc., New York. $5.00.

The authors have presented structural design in principle and as applied to our typical building construction. This third edition has been revised to take into account the 1946 revisions of the A.I.S.C. specifications. The subject of welding has been greatly expanded, including its application to framing connections, plate girders, roof trusses, etc. All the exercise problems are new.

The book is well written, has numerous illustrations and examples with special emphasis on their practical application.

Especially written to serve as a reference book for architects and engineers, it could also serve as a textbook for structural engineering students.

R.L.L., MWSE.

Electricity and Magnetism

Electric and Magnetic Fields, by S. S. Attwood, John Wiley & Sons, 1949. 475 pp. $5.50.

In this third edition, the author has modernized his intelligently written text book by conversion to rationalized MKS units, and by stressing the field concepts of electricity and magnetism. In addition, considerable material on field mapping has been included, with a generous number of carefully plotted examples distributed throughout the book.

One of the pleasing features of the book is the manner in which the author goes back to the physics of electricity and magnetism, and builds his discussion from there up to practical engineering applications. Too often, electrical engineering texts leave wide gaps between one and the other. Another attraction is the brief historical section in the appendix, which is a step toward the "humanizing" of engineering training.

Most engineers would probably question the author's claim that only "simple" mathematics is employed in this book, however. Usually, engineers have considered LaPlace's, Poisson's and Maxwell's equations as advanced mathematics.

W.F.L., MWSE.

Engineering Societies Personnel Service, Inc.

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SALES ENGINEER, B.S. E.E., Iowa State Coll. 1945. 1½ years' electronic development work on military proximity fuse; 2½ yrs. industrial engr. in job evaluation. Desire further expansion into promotional type activity. Minimum salary $4500. Location not important, 52-W.

ESTIMATING AND SUPERVISION of construction and erection. Grad. M.E. plus building estimating, Cor. School. Qualified to handle bidding and proposals. Wish position as a Junior Estimator or Sales and Service Engr., a position to advance with the business. Age 28. 53-W.

B.S. M.E. Purdue, 1944. Age 28. Four years' large electrical mfgr. drafting, and design plant quipment and installations. Wish Junior Mechanical Engrg. position at $300. Location: Midwest. 54-W.

PROJECT ENGINEER, industrial engineering graduate, age 29. Nine years' exp. includes machinist apprenticeship, work as a machinist, machine shop supervisor, some design and development. $4200. Chicago. 55-W.

ELECTRONICS ENGINEER, 3½ yrs. E.E. 34; 2½ years' instructor radio eng., 1 year production foreman and sales eng. electronic heaters. 3½ years maintenance and installation chief Signal Corps; radio and radar equipment. Desires project or sales engrg. $5000. Chicago. 56-W.

ASSISTANT CHIEF ENGINEER, grad. mech. engrg. Illinois license, age 30. 2½ years high pressure power plant operation and maintenance, 3½ yrs. machines, tools and special mechanical equipment for producing industrial power units. Know cost reduction, manufacturing processes, accounting, estimating and welding fabrication. Chicago. 57-W.

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R-6051 DESIGNER, structural, grad. or equivalent. Five years' exp., industrial type buildings, steel and concrete design and drafting. Able to work with little supervision. $400-$500. Chicago.

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In this Eightieth Year of the Western Society of Engineers, its Officers and Board of Direction greet you with wishes for a Happy Christmas and the Best of New Years.

Gustav E. Egloff
President